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The Journal OF Nervous and Mental Disease

Original Articles

A STUDY OF ERRORS IN THE DIAGNOSIS OF GENERAL PARESIS¹

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DIAGNOSIS OF GENERAL PARESIS

Two hundred and forty-seven cases of insanity were observed in the Danvers daily clinics and later autopsied in the pathological laboratory during the years 1904 to 1908 inclusive. 61 of these 247 cases, namely 25 per cent. were diagnosed with more or less certainty as cases of general paresis. 41 of these 61 cases were regarded as *clinically certain*, since every one present at the clinic committed himself to the diagnosis. 7 of the cases may be regarded as *clinically probable*, since the majority of

DIAGNOSIS OF GENERAL PARESIS

Clinically certain	41
Verified post mortem	35
Clinically probable	7
Verified post mortem	2
Clinically dubious	13
Found post mortem	6
Unexpectedly found post mortem (in series of 186) ..	2
Clinical total	61
Histopathological total	2 plus 43

¹ Read at the thirty-fifth annual meeting of the American Neurological Association, May 27, 28 and 29, 1909.

staff members favored the diagnosis. 13 cases are classified as clinically dubious, since, although the diagnosis of general paresis was prominently considered, other diagnoses were also possible. The clinically dubious group includes also cases in which diagnostic doubt was expressed by several staff members.

The table displays these cases of clinical general paresis together with the true diagnoses based on post mortem evidence. The table also includes two cases of general paresis unexpectedly found post mortem in the residue of 186 cases of this series (247 less 61 parietic).

Seventy per cent. of the cases in which general paresis was certain, probable, or even prominently considered, proved histopathologically cases of general paresis. Less than 1 per cent. of a series of 186 cases in which the diagnosis of general paresis was not considered, proved to be instances of general paresis.

It is clear that the errors in diagnosis found in the *clinically certain* group are of the first importance in our diagnostic study. 85 per cent of these cases obtained the correct diagnosis at staff meeting. What is the cause of incorrect diagnosis in the remaining 15 per cent.? There were six of such cases, and it seems worth while to present abstracts of the clinical histories and autopsy protocols in these cases.

The first wrongly diagnosed case was that of E. C., D. I. H. 11987, Path. Lab. 893, and has been amply described by Prof. A. M. Barrett as a case of *severe progressive arteriosclerotic brain atrophy with tabes-like complications* in his "Study of Mental Diseases Associated with Cerebral Arteriosclerosis," *Am. Jour. Insanity*, LXII, 1, 1905, pp. 48-50. The confusing feature from the standpoint of diagnosis was the tabes-like picture; and histopathologically there proved to be, in addition to bilateral pyramidal tract disease, a lumbosacral tabes or tabetiform disease.

The error in diagnosis in the second case, H. F., D. I. H., 11994, Path. Lab. 1118, is possibly attributable to complicating cerebellar and spinal cord disease. The diagnostic sheet reads: "General paralysis, made from characteristic signs, absent reflexes, speech defect, and general deterioration." The case seems worth presenting in detail.

H. F., male, gear maker, born 1850.

Heredity.—Maternal grandmother insane. Mother insane at 52, became demented and lost use of limbs, died at 71. Aunt insane.

Personal History.—Common school education. Capable workman till within a few months. Early in life alcoholic. Drunk almost every week until 1899 or 1900. Irritable, nervous, selfish, loose in relations with women. Venereal disease denied by wife. Married 1883. Three frail children. No miscarriages. Neuralgia in 1901 or 1902.

January, 1904, patient left carriage shop on account of mistakes in work, became more pleasant, childish, fearful, talkative, did funny things, later became vagrant, stole from fruit stores, smoked cigarettes picked up in street, and became restless and irritable.

Committed to D. I. H., June 24, 1904, with slightly enlarged heart, somewhat heightened blood pressure, and a slight sediment of epithelial cells in urine.

Romberg's sign was present, but there was little or no demonstrable incoördination otherwise. Very slight tremor of fingers. Left knee jerk absent, right obtained on reënfacement. Achilles jerks absent. Triceps, wrist and normal plantar reflexes present. Pupils reacted to accommodation but very slightly, if at all, to light. Sensations normal except in legs. The legs show preservation of tactile and temperature senses, but abolition of pain sense except over dorsum of foot.

Speech showed slurring of syllables and "brigrade." for "brigade." Disorientation for time, place and in part for persons. Admitted that his work had been deficient, but regarded himself as well. Emotionally variable, crying at times and suddenly becoming jocular.

Eloped July 3 and somehow reached his wife's house in a neighboring city.

Euphoria persisted. The pupils continued Argyll-Robertson, and the knee jerks remained absent. Became oriented for place and partially as to time (month and day of week correct).

During 1905 failure became rapid with ataxia of legs, persistent euphoria, and loss of weight.

Convulsions, regarded as general paretic, developed in 1906. Death sudden December 7, 1906.

Post Mortem Findings.—The cause of death was streptococcus septicemia, probably derived from a gangrenous bronchopneumonia or related with a small thrombus of the right auricular appendix. There was also an acute purulent otitis media, mastoiditis and sphenoidal sinusitis, as well as extensive decubitus. From this decubitus or from the intestinal tract may have been derived the numerous colonies of *Bacillus coli communis* which developed on plates from the cerebrospinal fluid.

Arteriosclerosis was little in evidence, being confined to the coronary, right vertebral and carotid arteries (slight in all). Cysts of softening existed in the posterior part of each dentate nucleus and may probably be interpreted as indicating vascular disease.

Chronic disease outside the nervous system was prominent and in part suggestive of senile findings: milk patches of pericardium, adhesions about liver and gall-bladder, adhesions about spleen, adhesions and fibrous thickening of parietal peritoneum, adhesions in both pleural cavities, chronic diffuse nephritis, hypertrophy of bladder wall, dense calvarium, dural adhesions.

The *nervous system* showed several unexpected features. The *absence of chronic leptomeningitis* was striking: the pia mater was everywhere delicate and transparent except that the walls of the cerebellar and chiasmal cisternæ were thickened and that there were slight opacities along the sulcal veins of the convexity. Brain weight 1,090 grams. There was a generalized *sclerosis and pigmentation of the cerebral cortex*. The sclerosis varied in degree and was most marked in the prefrontal regions, the anterior halves of the superior frontal gyri, the middle third of the right precentral gyrus, the region of the splenium on the left side, and the sagittal rami. If the *Bacillus coli communis* found in the cerebrospinal fluid had any effect upon the consistence of the brain, obviously hard to prove in a brain of leathery consistence at the outset, it was shown only in the right Rolandic area in the vicinity of the sclerotic part of the precentral gyrus. *Granular ependymitis* of all ventricles. Weight of cerebellum, pons and bulb 135 grams. Perhaps the most remarkable feature of all in the case was the occurrence of *cysts of softening* in the posterior part of each *dentate nucleus*.

The third case of diagnostic error was that of C. D., D. I. H. 12,263, Path. Lab. 924.

Heredity.—Mother dead of phthisis at 63. Two sisters and three brothers living and normal. One brother dead of mastoid abscess. One sister recovered from "nervous prostration"; one sister "peculiar."

Personal History.—Born 1849. Education limited. Calculating ability always good. Occupation at first hostler, later assistant with wholesale drug company for 32 years. Tobacco in excess till 1901. Moderate constant use of alcohol till 1899. "Nervous prostration" (seclusive, "head troubled him") about 1894. Otitis media (delirium, swelling of feet, "rheumatism") in 1898. Since this attack of otitis media "not altogether right," "a little off in his talk at times." In 1902 patient quarreled with his employer and left work. Since then has traded in hens and pigs, has done "peculiar" things, has become forgetful especially of recent events. Married in 1872. (Miscarriages of unknown cause.) Venereal disease denied. No children.

In 1904, a week before commitment, had a spell of unconsciousness for several hours. Afterwards speech was thick and restlessness, insomnia, and a vagrant tendency set in.

Before commitment had visual hallucinations. Fabulation. Tremors. Conjunctivæ injected; eyes "excited looking." Pa-

tient swept things from dining room table. Drew a hot stove into the middle of the room. Attempted to sweep paint off the floor and cut up the carpet with a knife. The patient on commitment November 5, 1904, was well developed and nourished. The mucous membranes were rather pale. Bruises and excoriations of limbs. Harsh breathing at the base of each lung. Enlargement of heart; sounds irregular. Accentuation of aortic second sound; tension fair, rate 80. Slight brachial arteriosclerosis. Abdomen slightly distended. The urine contained a faint trace of albumin and many hyaline casts.

Moderate tremor of extended hands. Slight tongue tremor. Romberg's sign absent (slight swaying). Considerable ataxia of extremities (inability to stand with foot on opposite knee). Vision poor. Hearing could not be tested accurately. Prompt pupil reaction with direct light. Slight consensual reaction in left pupil, absent in right. Deep reflexes equal and lively.

Quiet and orderly at first. Later restless and noisy. Questions were answered somewhat relevantly, more often irrelevantly. Patient irritable, intractable. Required repeated urging to take nourishment. Consciousness clouded. Orientation imperfect. Attendants are possibly "officers." Date September, 1995. Slight errors in repeating alphabet. Mistakes in Lord's prayer with rhyming tendency. Simpler arithmetical tests answered automatically with many mistakes. More complex combinations incorrect. Hand writing tremulous (noted as "typical" of general paresis). Auditory hallucinations (answering invisible persons), "All right, I am coming." Amnesia and fabulation. Q. "Have you had breakfast?" A. "No," (later), "Yes, I had a very light breakfast." Q. "What did you have?" A. "Anything that came along. A few green peas and beans that were left, bread and butter and pie. I had a good breakfast. Guess feed is very high." Q. "Give names of your sisters and brothers." A. "There are three or four I never see. I will have to think them up." (Later)—"Lillie, Abbie, Julia, George." On repetition of question, "Elizabeth, Julia, Annie and Lizzie."

Delusions somewhat doubtful. At no time euphoria.

The patient remained only nine days in the hospital, developing diarrhea a week after admission.

Post Mortem Findings.—The *cause of death* was bilateral bronchopneumonia of hypostatic distribution, accompanied by bronchitis and acute splenitis. The intestinal tract was normal (despite the clinical diarrhea). No cultures. The heart showed acute myocarditis.

The vessels in general showed no sclerosis, except that the aorta showed a few patches with calcification near bifurcation. There was a moderate degree of mitral sclerosis. The kidneys showed a moderate degree of chronic interstitial nephritis. The heart weighed 530 grams and there was moderate dilatation of all the valves.

There were some evidences of *chronic disease outside the nervous system*, namely, an obliterative pleuritis on the right side, chronic perisplenitis, and chronic external adhesive pachymeningitis.

The *nervous system* showed a pia mater thin and transparent, with a moderate congestion of larger and smaller vessels. No noteworthy change of the brain substance or of the ventricles was found, except that the cerebral substance was of unusual firmness (autopsy twelve hours after death).

The fourth case of diagnostic error was that of J. B., D. I. H., 12486, Path. Lab. 1011.

J. B., male, printer. Born 1855 in England. Relatives are said to have been generally long lived.

Personal History.—Married in 1875 (two children, healthy; again married in 1893 (one child, healthy). Compositor from 1890. In 1898 and 1899 girdling and lancinating pains. Thereafter for several years gait was unsteady. During 1904 and 1905 freedom from pains and improvement in gait but gradually increasing irritability and nervousness. Stopped work on the last of March, 1905, owing to sudden increase of irritability, emotionality, boastfulness, expansive schemes, and ataxia.

Habits: no tobacco, very little alcohol at long intervals. No drug habits, no sexual irregularity known.

Committed to D. I. H. April 3, 1905, with slight muscular development, poor nutrition, acne, irregular poorly preserved teeth, gingivitis, flat-foot, slight radial arteriosclerosis, slight arcus senilis, a few hyaline cases, leucocytes, epithelial cells, and trace of albumin in the urine, scar in sulcus, and enlarged inguinal lymph nodes.

Ataxic gait, Romberg's signs, fibrillary twitching of chest, abdominal and facial muscles when standing; right pupil slightly larger than left, pupillary margins irregular, light reactions (electric bulb test) both consensual and direct absent, slight pupillary reaction in accommodation; biceps, triceps and wrist reflexes lively and equal; abdominal, cremasteric and plantar reflexes normal, knee jerks, Achilles and front taps negative even on re-enforcement.

The patient himself stated that his ataxia began in 1904, that he had been under treatment for swelling of legs and feet and pain in limbs since 1903, and that there had been some trouble with limbs since 1895. He had been told that his disease was lead-poisoning. About three weeks before commitment patient said he had had an attack of unconsciousness.

The patient's speech showed considerable defect. Words were pronounced slowly with slurring and tripping especially of the labials. Orientation perfect. School knowledge well retained. The easier arithmetical problems were accurately performed. Memory imperfect for minor recent events. Estima-

tions of space and time often very imperfect. Variability of mood, sometimes euphoric sometimes tearful and irritable. Occasional expansive estimates of personal powers ("Can lift three five-hundred pound weights with one finger"). Indistinct expansive financial ideas.

The patient continued oriented, euphoric, expansive, untidy till October, 1905, but on October 12 developed an infection at the site of a callus on the sole of the foot and died with pyemic symptoms, October 17.

Post Mortem Findings.—The cause of death was streptococcus septicemia with acute ulcerative colitis, acute splenitis, bilateral purulent pleuritis, multiple infarctions of lungs.

There were no signs of *chronic disease outside the nervous system* except a moderate thickening of the mitral valves, and slight dural adhesions.

The brain weighed 1,450 grams. The vessels at the base showed a slight degree of sclerosis. There was a slight opacity of the frontal, parietal, and temporal lobes overlying slightly atrophied convolutions, whose surfaces showed in a few places slight cuppings. The ependyma over the thalami and the floor of the fourth ventricle was finely roughened. The spinal cord showed a typical *tabes dorsalis*.

The fifth case of diagnostic error was that of C. E., D. I. H. 13829, Path. Lab. 1251.

C. E., female. Born 1859. Normal school girl till 15, apt in studies, mill worker till marriage at 18, one child, dead (cause unknown). Habits good. Moderate deafness set in in the patient's forties and in 1901 patient became suddenly completely deaf in three months time. In 1905 she became unable to take care of her house and had a shock in which the right leg was affected.

On commitment patient showed good development and nutrition with slight enlargement of capillaries of cheeks, redness and roughening of skin of right ankle. Teeth absent. Slight radial and brachial arteriosclerosis. Urine negative.

Sluggish pupil reactions to light both directly and consensually. Deafness absolute, bone conduction defective. Arm reflexes brisk, knee jerks equal, brisk. Bilateral Babinski reaction more marked on the right side, tremor of tongue, Romberg's sign, gait defective. Speech stumbling, writing clear, without tremor.

Communicated by writing only. Consciousness normal, disorientation for day of month, for place (misnames hospital) and for persons (recognizing nurses, not patients).

Patient wrote many letters complaining of pain, headaches and especially of pain in the abdomen and side. The patient was thought to show a slight defect of memory, but her deafness

rendered diagnosis difficult. The patient died suddenly on May 23, 1908, shortly after supper, falling backwards, and dying in five minutes with marked respiratory distress.

Post Mortem Findings.—The *cause of death* was not clear. The heart's blood and cerebrospinal fluid were sterile. There was a small hemorrhage in the anterior part of the right ventricle derived from a small artery of the caudate nucleus. There were about 400 c.c. of blood between the dura mater and the pia mater. There was a slight sclerosis of the basal and Sylvian arteries. The brain substance was uniformly softer than normal.

It is possible that the hemorrhage had taken place sometime before the patient's fall and that the brain substance had swollen in consequence. Just before the patient's fall she had had a weeping spell.

The anatomical diagnoses were as follows:

Anatomical Diagnoses.—Obesity, unequal pupils, fresh wound near left ear, edema of legs, slight focal adhesive pleuritis, hypostatic congestion of lungs, chronic endocarditis, chronic myocarditis, congestion of kidneys, congestion of pancreas, subacute splenitis, chronic adhesive pelvic peritonitis, hematoma and cystic condition of Fallopian tubes, calvarium dense and thick, subdural hemorrhage, slight chronic leptomeningitis, general cerebral atrophy, marked in tips of frontal lobes, old cyst of softening between left corpora albicantia and optic chiasm, small punctures of left ear drum, drums opaque, chronic spinal leptomeningitis, brain weight, 1,190 grams.

The spinal cord showed firm adhesions between dura and pia throughout. A lumbar puncture soon after admission in 1907 had shown:

	Per Cent.
Endothelial cells	10
Lymphocytes	30
Plasma cells	0
Phagocytes	0
Polymorphonuclear cells	51
Unclassified	9
Fibroblasts	0
Cells in 100 fields	125

The sixth case of diagnostic error was that of H. W., colored, D. I. H., 13832, Path. Lab., 1257.

H. W., male, born 1871. Learned to read and write at school. Stableman and coachman. Alcoholic till 1902. Took much quinine, possibly impairing hearing thereby. Memory impaired and growing worse since 1902. Gait unsteady for a longer but unknown period. August 13, 1907, wandered about, instead of attending boot-black stand, muttered, talked incoherently. In the next few days talked about religion and apparently had hallucinations of hearing. Committed August 16, 1907. On com-

mitment stoop-shouldered, flat-chested. Gait straddling. Unsteadiness in Romberg's position. Incoördination of arms and fingers. Coarse tremor of tongue. Tremor of lower jaw. Exaggeration of left knee jerks and diminution of right. Exaggerated Achilles jerks. Spurious left ankle clonus. Questionable Babinski reaction of left side. Abdominal and epigastric reflexes present but cremasteric absent. Left pupil smaller than right and fails to react to light. Reaction of right pupil sluggish. Moderate defect of hearing of both sides.

During the first week the patient developed hallucinations of sight and hearing, but of no other senses. Disorientation for time, place, and persons. Answers to arithmetical problems given with assurance but as a rule incorrectly (as 17 and 32 are 90; 18 divided by 3 = 88). Handwriting scarcely legible. Memory poor, especially for recent events (recalled a lumbar puncture as an exercise in baptism). Impressibility and attention poor. Euphoria. Death after gradual failure July 29, 1908.

Lumbar puncture showed:

	Per Cent.
Endothelial cells	9
Lymphocytes	81
Plasma cells	6
Phagocytes	0
Polymorphonuclear cells	4
Unclassified	0
Fibroblasts	0
Cells in 100 fields	700

Post Mortem Findings.—The cerebrospinal fluid showed a pure culture of *Bacillus coli communis*, and the heart's blood showed many colonies of an unidentified bacillus. Culture from mesenteric lymph nodes sterile.

The *cause of death* is somewhat in doubt. There was an early pneumonic process with fibrinous pleurisy, and there was an early acute hemorrhagic ileitis with a very slight overlying peritonitis and slight corresponding enlargement of mesenteric lymph nodes. There was an infection of the meninges with *Bacillus coli communis*.

Evidences of *chronic disease outside the nervous system* were: coronary and pulmonary arteriosclerosis, chronic fibrous endocarditis, mitral sclerosis, aortic sclerosis with calcification, chronic splenitis, chronic interstitial nephritis, hepatic atrophy (? , 900 grams), thickening of cartilaginous portion of right auricle (old trauma?), scars of apices of lungs.

The *calvarium* was dense and the *dura mater* everywhere adherent. The *arachnoidal villi* were but slightly developed, but there was one small focus of cortical herniation through the *dura mater* of the left middle cranial fossa. The *pia mater* was delicate except for slight opacities along sulci. There was some

pial thickening over the region of the interparietal sulci on both sides. There was pial pigmentation anteriorly and superiorly. There is no gross evidence of intracranial arteriosclerosis, except (1) that afforded by the lesions of the dentate nuclei of the cerebellum mentioned below and (2) the swerving to the right of the basilar artery, possibly due not to arteriosclerotic lengthening of the artery but to an unusual shape of the pons (see below).

The *brain* weighed 1,245 grams (cerebellum and pons 165 grams). The anatomical diagnoses of central nervous system were:

Slight general encephalomalacia (post mortem imbibition of fluid, 31 hours). Slight gliosis of right prefrontal and frontal gyri. Slight gliosis of right optic thalamus. Generalized granular ependymitis, especially near fornix and about foramina of Monro. Anomaly of pons (not gliotic, but possessing far more white matter on the left side than the right). Severe arteriosclerosis confined to the dentate nuclei of the cerebellum.

Microscopic Examination.—The microscopic examination was carried out *for the purpose of learning whether*, in addition to the various evidences of nerve cell destruction and gliosis which might be consistent with the diagnosis of general paresis, *the tissues showed plasma cells*. Although it is well established that plasma cells occur in brain tissues in other conditions than general paresis (e. g., trypanosomiasis and certain other chronic meningoencephalitides) and although the cytology of the lumbar puncture fluid may be identical in general paresis and in tuberculous meningitis, yet it seems certain that the diagnosis of general paresis cannot be regarded as fully established unless plasma cells are demonstrable either in the lumbar puncture fluid or in the brain tissues. So much must now be assumed as a result of the labors of the Nissl school.

For the identification of plasma cells, Nissl's original methylene blue method (with certain inessential modifications) and the pyronin method of Leo Ehrlich (a production of the Unna school) were used in all cases.

The superior frontal, precentral, superior temporal and calcarine gyri of the cerebrum, several cerebellar areas, and three levels of the spinal cord, fixed in alcohol, were examined as routine in all the cases. In the special cases of erroneous diagnosis just described, a varying number of additional blocks was also subject to examination. Although it must be conceded that, strictly speaking, the whole brain must be gone over if one is to exclude absolutely the presence of plasma cells in some focus, yet I believe we can be reasonably certain of the correctness of these particular diagnoses. This belief is justified both by the anatomical features of the cases and by the possibility of explaining the clinical features of the cases on the ground of other positive (non-paretic) changes.

GROUPING OF CASES.

Thus anatomically we may sum up the cases as follows:

I. *Tabes dorsalis* and severe progressive arteriosclerotic brain atrophy.

II. Cysts of softening in both dentate nuclei of cerebellum and diffuse brain atrophy.

III. Cerebral sclerosis.

IV. *Tabes dorsalis* and slight atrophy of frontal, parietal, and temporal gyri.

V. Chronic spinal meningomyelitis, diffuse brain atrophy (especially prefrontal), and focal encephalomalacia.

VI. Severe arteriosclerosis confined to dentate nuclei of cerebellum and slight sclerosis of right prefrontal and other frontal gyri and of right optic thalamus.

From this analysis it is clear that the cases fall into three groups: I and IV showed a combination of more or less severe brain disease with *tabes*. II and VI showed a combination of more or less severe brain diseases with a striking *cerebellar involvement* (evidences of arteriosclerosis in the dentate nuclei). V was a case of marked meningomyelitis and subcortical encephalitis (luetetic?). III was a case in which slight cerebral sclerosis was the only anatomical finding.

A. CONFUSION OF GENERAL PARESIS WITH MENINGOMYELITIS AND SUBCORTICAL ENCEPHALITIS.

Case V gives evidence of marked cortical destruction. Perhaps no layer of the cortex in all the areas examined fails to show some atrophic alteration. But the suprastellate layers are everywhere more severely diseased. In particular the layer of moderate-sized pyramids seems to show a fairly even atrophy throughout, whereas the layer of small pyramids and the layer of large external pyramids are more focally affected. Satellitosis accompanies the atrophic process in many regions. Subpial gliosis is a constant feature. The white matter in all areas shows a considerable increase of neuroglia.

Unlike the other two cases of the *tabes* group (I and IV), this case shows *lymphocytic deposits*. These are decidedly subordinate in the cerebral cortex, cerebellum, and basal ganglia to the evidences of nerve cell destruction; but perivascular infiltrations, confined to a few of the larger vessels of the white matter, are

found in superior frontal, superior temporal, and hippocampal gyri.

But in the *spinal cord* the most severe infiltration is in the gray matter, where it accompanies severe nerve cell changes and extensive arterial changes. The spinal meninges are also packed with mononuclear elements (among which, however, no plasma cells are found). Appropriate stains demonstrate an extensive loss of medullated fibers in a broad peripheral zone running all the way about the cord at most levels, but almost constantly about the anterolateral columns. Vascular changes and mononuclear infiltrations accompany this marginal sclerosis, penetrating the cord to an unusual distance.

The distribution of these lesions recalls a case described by Putnam and the writer in which there was good evidence of syphilis. In this case the evidence is not so good; but the case is clear so far as the main diagnostic features are concerned.

An instance of active meningomyelitis and subcortical encephalitis with atrophic changes in the cerebral cortex has therefore been confused diagnostically with general paresis. An indication of the possible line of differentiation in future cases is afforded by the cytology of the lumbar puncture fluid, which yielded lymphocytes but *no plasma cells*. Without this laboratory aid, the diagnosis must remain difficult. It is probable that the Wassermann reaction would prove of no differential aid in this particular difficulty.

B. CONFUSION OF GENERAL PARESIS WITH TABES DORSALIS PLUS NON-PARETIC CEREBRAL DISEASE.

Combinations of mental symptoms of whatever sort with the phenomena of tabes dorsalis will doubtless raise in most medical minds the suspicion of general paresis. This has become the more true now that a significant part appears to be played in both tabes and general paresis by antecedent syphilis. Some are inclined to hold to the identity of the two diseases. The general resemblance of lumbar puncture fluids (cytology) in the two diseases also lends color to the identification.

The lesions of the two diseases are, however, quite distinct, and their genesis, were it understood, would undoubtedly show important differences.

Nothing could be clearer than the combination of lumbosacral

tabes with multiple foci of encephalomalacia presented by case I. Outside the foci of encephalomalacia the cortex is in a good state of preservation, except that subpial gliosis is almost everywhere marked.

Case IV microscopically presents in all areas examined a high degree of satellitosis. The satellite cells accumulate so as often to appear in groups of eight or ten about atrophying cells. Such satellite cells often occupy niches in atrophying nerve cells. The process is most abundantly shown in the layer of large external pyramids (e. g., motor), but is also shown in the infragranular layers. The infragranular layers as a rule, in this case, are comparatively poor in cells.

The satellitosis and nerve cell destruction were found in approximately equal degree in all blocks examined from case IV. Perivascular cell accumulations were slight, and consisted of pigmented cells and a few mononuclear cells somewhat suggestive of lymphocytes. But no undeniable lymphocytes and no plasma cells were found.

The tabes was striking, but there was no evidence of pyramidal tract disease in Weigert preparations of the spinal cord.

C. CONFUSION OF GENERAL PARESIS WITH ARTERIOSCLEROTIC BRAIN DISEASE HAVING SEVERE CEREBELLAR INVOLVEMENT (DENTATE NUCLEI).

Of the two cases in this group, II showed somewhat questionable Argyll-Robertson pupils and VI showed an Argyll-Robertson effect in one pupil only. Both showed Romberg's sign as well as certain alterations in deep reflexes.

The unqualified assertion that cerebellar disease had been the chief cause of diagnostic error in these cases would be unwarranted.

The spinal cord was not quite normal in either case. Case II showed a tabetiform lesion in the cervical cord (not elsewhere), together with a unilateral degeneration suggesting in some respects a radicular origin (high thoracic or low cervical). Case VI showed no tabetiform lesions, but in all segments examined an unusual display of corpora amylacea of wide distribution, as well as a moderate lymphocytic infiltration of the meninges. On the whole, however, it does not seem possible to relate the tabetic symptoms with certainty to any spinal cord lesion in Case VI.

What part can be assigned to dentate nucleus involvement?

Case II, in which the dentate nuclei were in large part destroyed by cysts of softening, shows a fairly well-preserved cerebellar cortex on both sides (moderate gliosis of Purkinje cell belt with some loss of Purkinje cells).

Case VI, in which the dentate nuclei were not destroyed but affected by cell atrophies of variable degree in various parts of the dentate convolutes, showed severe gliosis of the cerebellar cortex, involving more particularly the Purkinje cell belt and the molecular layer, but also to some extent the granule layer. In the regions so far examined the left hemisphere of the cerebellum is more severely diseased than the right.

Comparing the cerebral cortex in the two cases, we find some differences. Case II shows little more than a fairly even degree of subpial gliosis in all regions, together with a varying degree of atrophy rather generalized in the different layers and marked neuroglia cell pigmentation. Case VI showed far more marked generalized cell atrophies throughout the layers with considerable subpial gliosis. Perhaps the superior temporal gyri showed the most marked cell atrophy.

The comparative analysis of these two cases seems to exclude cortical disease from playing much part on the neurological side, and even on the psychiatric side the data are equivocal. Since only one of the cases showed a well-defined spinal cord disease (and this of limited character and but doubtfully related with the neurological symptoms), it seems possible, at least, that the cerebellar disease in the two cases played some part. It seems especially possible that the Romberg phenomena may be related therewith. But it is obvious that further experience with dentate nucleus disease is necessary for a decision.

D. CONFUSION OF GENERAL PARESIS WITH CEREBRAL SCLEROSIS (TYPE, PERIVASCULAR GLIOSIS).

This case has been previously reported by Mitchell and the writer in their analysis of insanity arising in the sixth and seventh decades (Case 9), but without mention of the striking fact that the examiner (Dr. F. R. Sims), as well as Drs. A. M. Barrett and H. W. Mitchell, were all disposed to make the diagnosis "general paresis." An examination of all the data in the case leads to the conclusion that the case belonged rather in the "probable" than in the "certain" group (see table, *supra*).

Microscopically, case III showed some features of interest, especially multiple focal neuroglia-cell proliferations of a perivascular distribution, considerable subpial fibrillar gliosis of an unusually focal type, and a rather general subpial cellular gliosis. The findings seem to argue a progressive or at all events an active process, and a process starting not so much in relation with dying nerve cells as in the neighborhood of the vessels.

The acute or cellular perivascular glioses are very striking lesions. They are confined almost exclusively to the substellate (infragranular) cortical layers, sometimes trenching slightly on the layer of stellate cells and occasionally wholly included in the white matter in the immediate vicinity of the gray.

In the absence of bacteriological examination, it is rash to suggest the possible nature of this case. Perhaps the cortex findings indicate the effect of a toxine, as many of the autopsy data indicate possible septicemia.

At all events the brain was not wholly normal, exhibiting slight general induration due in part to subpial gliosis and in part, doubtless, to perivascular gliosis. The more serious involvement of the infragranular cell layers suggests obvious comments concerning function; but these must be postponed until other cases of this kind have been studied.

The diagnosis of general paresis in this case was, therefore, not justified. Although at first sight it may seem odd that cerebral sclerosis should clinically imitate the meningoencephalitis of paresis, yet the perivascular distribution of the most recent gliotic processes in the cortex suggests the possibility that non-exudative lesions may sometimes imitate exudative lesions *in clinical effects*.

CONCLUSIONS.

1. An effort has been made to establish the accuracy of diagnosis in general paresis. The method has been to analyze clinically the data of cases in which several experienced workers had agreed upon the diagnosis and to compare their findings with the anatomical and histological data of the autopsies.

2. 35 out of 41 cases unanimously diagnosed general paresis ante mortem proved to be cases of general paresis (85 per cent. accuracy).

3. 6 cases of erroneous diagnosis have been especially studied. None of these showed plasma cells in the nerve tissues (Nissl's

methylene blue and L. Ehrlich's pyronin methods), but all showed a variety of lesions which warrant placing them in an "organic" group.

4. The lesions probably responsible for the errors in diagnosis were: (a) Meningomyelitis and subcortical encephalitis (luetie?), case V; (b) tabes dorsalis and non-paretic cerebral disease, cases I, IV; (c) arteriosclerotic brain disease with severe cerebellar involvement (dentate nuclei), cases II, VI; (d) cerebral sclerosis (type, perivascular gliosis), case III.

5. Although at first sight a probable error of 15 per cent. in the diagnosis of general paresis might suggest difficulties in possible medicolegal cases, it is obvious that, were the diagnosis confined to "incurable insanity" or even to "organic brain disease," the error would disappear. However, 2 cases proved to be general paresis (on the plasma-cell criterion) in a series of 186 cases similarly examined in which the diagnosis of general paresis was not considered.

6. Improvements in our diagnostic ability could perhaps be introduced by lumbar puncture and cytological examination in a greater proportion of cases. But, it is doubtful whether three of the six errors here studied would have been resolved by cyto-diagnosis (meningomyelitis, tabes dorsalis). One other case (VI, arteriosclerotic brain disease) actually did show plasma cells in the lumbar puncture fluid, the source of which was not made out at autopsy.

TYPE AND DISTRIBUTION OF SENSORY DISTURBANCES DUE TO CEREBRAL LESION¹

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The researches of Head and others have determined typical combinations of various forms of sensory loss when due to lesion in the spinal cord. This is because of the fact that the various kinds of sensory impulses pass upward in the spinal cord in definite tracts which are well separated from each other, so that the forms of sensation which would be lost if only a part of the cord is destroyed, will usually be in fairly definite combinations. Dissociation of sensation results not only from spinal lesion; it also occurs from lesion of the peripheral nerves or of the spinal roots, but the combinations of sensory qualities lost through a peripheral nerve injury or an injury to the posterior spinal nerve root differ decidedly from those due to partial destruction of the spinal cord. Many investigations show that in cerebral affections, also, we can have a dissociation of sensation among the symptoms. The clinical studies of Gordon (1) show that following cerebral lesions, pain was the sensation most affected. Karl Schaffer (2) found the sense of motion and position frequently disturbed and speaks of defect of localization of sensation as especially characteristic of sensory defects due to subcortical lesion. Morton Prince (11) reported a case of compound fracture of the skull in the parietal region in which there was no anesthesia or analgesia but in which there was a marked defect in localization of sensation in the hand and, to a less extent, in the foot. The error of localization in the case was usually distal, which is the opposite of that found by Russel and Horsley in their cases. An interesting observation in Dr. Prince's case was the difference between the result when using the "naming" test, asking the patient to name the spot touched,

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and when using the Volkmann method, asking the patient to put his finger on the spot which had been touched. By the "naming" test the errors were marked, neither the finger nor the segment of the finger touched could be named correctly, but by the Volkmann method the localization of sensation on the palm of the hand was found nearly normal while on the dorsum the errors were not marked and were postaxial and preaxial oftener than errors as to the segment of the finger. There was also loss of the sense of pressure and of the sense of position and complete astereognosis in the affected hand. Sandberg (12) reported twenty-two cases of sensory disturbance due to cerebral lesion and found tactile sensation affected in all of them. Pain sense was retained and he calls attention to the feeling like an electric shock which these patients experienced when pricked with a needle on the affected side. The temperature sense was retained, but it took a longer time to obtain the reaction on the affected side than it did on the sound side. Errors in the localization of sensation were more marked in the "breadth" than in the "long dimension." Sandberg comes to the conclusion that the dissociation of sensation from cerebral lesion is similar in type to that seen when the posterior columns of the spinal cord are affected, "Hinterstrangtypus." Starr (3) speaks of meeting with cases of various forms of sensory dissociation due to cerebral lesion. Lewandowsky (13) reports a case of Jacksonian epilepsy followed by hemiplegia in which there was subjective sensation of coldness on the paralyzed side and he attributes this to a diminution of the temperature for heat; apparently showing that the sense for heat may be affected when that for cold is not affected, from an organic brain lesion. Klippel, Sergueeff and Weil (15) reported a case in which there was slight diminution of sensation to touch but none to pain sensation. A piece of ice was felt as pain but with no sensation of cold. Warm objects were not recognized as such but simply as contact. The application of something very hot was recognized as painful but there was no sensation of heat. There was marked defect in localizing sensation and in the sense of position. The authors regarded the symptoms as due to lesion in the optic thalamus.

It would appear however from an analysis of these studies that there was no definite combination of forms of sensation

which would be lost from a cerebral lesion but that all forms are likely to be affected on the same side of the body, the side opposite the lesion, and the form of sensation most affected will depend on the location of the lesion in the brain, whether it is cortical, subcortical, in the internal capsule or elsewhere. It may be of distinct value as a localizing sign.

The distribution of the sensory loss which was outlined by the above-named authors was a partial hemianesthesia with the more marked impairment of sensation toward distal parts of the extremities, thus the hand was more affected than the forearm, the forearm than the arm and so on, without however, any sharp lines of demarcation.

In 1904, C. K. Mills (quoted by Spiller) suggested "that the cortical sensory area for the upper limb is probably separate from that for the lower limb" and, according to the same authority, this view has been entertained by Campbell and others. Spiller (14) reported a case of a man who having received a blow on the parietal region had sensory disturbances in the hand and arm but none in the face or leg. There was hypesthesia, hypalgesia and thermanesthesia but the first was the most marked. There was decided defect in "spacing sensation" and the sense of position of the fingers. Spiller says, "The case seems to indicate that the sensory center for the upper limb must be distinct from those for the face and lower limb." Mills and Weisenburg² (4) when they found the radial side of the hand more affected than the ulnar in a case of hemiplegia with hemianesthesia attributed it to the fact that the radial side had more complicated function and so a higher cerebral organization which would be more easily and permanently affected.

According to Straussler (5), Muskens (6) was the first to suggest that the sensory projection of the body surface on the cortex of the brain followed the same principle of segmentation as is seen in the spinal cord. Benedict (9) reported cases of partial hemianesthesia from cortical lesion in which the sensory loss had a metameric distribution. Russel and Horsley (10) reported five cases which apparently bear out the view that there is a re-representation in the cerebral cortex of the type of sensory representation as it exists in the spinal cord and they regard it as "demonstrated that in cases of lesion of the kinesthetic cor-

²See Transactions of American Neurological Society.

tex the spinal type of sensory representation, i. e., one parallel to the principal axis of the limb, asserts itself in all compound movements and in conscious perception of touch and points of contact in space."

Straussler (1. c.) recently recorded a case which apparently upholds the view that the cerebral cortex contains sensory areas which represent spinal segments and hence re-represent the distribution of the sensory roots of those segments. The patient was an infantry man aged 22 years who had an endocardial lesion. He had convulsive attacks which began in the right arm and were followed by right-sided hemiplegia with the characteristics of an organic paralysis. Sensation to touch, pain and temperature were diminished over the right side of the body but were lost in areas which, according to Starr's (1. c.) diagrams, corresponded approximately to the sensory distribution of the fourth cervical and second, third and fourth dorsal segments of the spinal cord, except that posteriorly the area did not extend to near the median line.

Goldstein (16) has recently taken up the subject of "Cerebral Sensory Changes of Spinal Type" and reported a case in which, following a sudden attack of unconsciousness, there was slight right hemiparesis with some aphasic symptoms and disturbed sensation on the right side of the body and right arm and leg. The most interesting points about this sensory disturbance were, that it was much more marked in certain areas which nearly corresponded to the sensory distribution of certain spinal segments, particularly was this true of the areas of skin supplied by the fourth cervical to the fourth dorsal spinal segments; on the dorsal part of the arm, the ulnar side was more affected than the radial; this last observation is the opposite of the condition described by Mills and Weisenburg and seems to show that their explanation for the differences between the two sides in their case, i. e., the more complicated function of the radial side, is inadequate.

A case was admitted to my service at the University of Michigan Hospital on March 24, 1908, in which there was evidently from the history a post-operative cortical lesion in the right parietal lobe of the cerebrum. There were epileptic attacks with a sensory aura, a left hemiparesis and sensory disturbances on the left side of the body. There was dissociation of the different

forms of sensation and the analgesia had a distribution which in part was very suggestive of that which follows a lesion of spinal nerve roots, i. e., spinal segmental.

Martin M., aged 40 years, an American railroad conductor.

Family History.—Father died of old age. Mother died of heart trouble. Six brothers and four sisters all well.

Previous Medical and Social History.—Said he never was sick a day in his life. Denied venereal diseases. Never drank to excess. Married; had two children.

History of present illness, confirmed by his wife: He was in a railroad accident August 15, 1906, and was run over by a train, his right arm cut off and the right side of his head injured. He was paralyzed on the left side following the accident and was treated at the company hospital. His memory from the time of the accident up until the next January was very vague. He said that he was unconscious but meant that he did not remember anything that occurred during that time. In January he was operated on at Wheeling and said that at that time pieces of steel were removed from his head. He improved after the operation so as to be able to be about; for three months previous to his admission to the University Hospital he had been getting worse. There was never any difficulty in speech and he read and understood all that he read. Before his operation he was unable to move the left arm or leg, but after the operation the left arm improved to the present condition and he was able to walk about unsupported. The left arm remained in the improved condition but since he has been getting worse the left leg has become more paretic and when admitted to the hospital he was unable to walk without support.

He said that he had had spells (the last one a month before the examination) in which he felt as if his left leg was going up in the air, though it did not move. Then he pulled his head to the right and lost consciousness. His wife says that he jerked in the attacks and had bitten his tongue while in them but never had any incontinence of urine. When he regained consciousness he was weak and dazed. At other times he has a feeling of weakness with the above described aura but no convulsive attack. When he moved the stump of the right arm he had associated movement in the left arm. He has also noticed that when he gaped his fingers would straighten out and would slowly return to their former position after the gape ceased.

On March 25, 1908, an examination showed that the patient was a well-nourished man with the right arm off just below the shoulder. His gait was of the hemiplegic type and there was no ataxia and no Romberg symptom. There was a small depression in the parietal bone, four inches, vertically, above the external auditory meatus; about an inch and a half long and about an inch wide. The depression was tender to pressure but there was

no tenderness of other parts of the scalp. He said that the scalp on the right side was itchy. The pupils were equal, and reacted to light and to accommodation. The tongue protruded in the median line. In showing the teeth the right corner of the mouth was drawn back farther than the left but there was no asymmetry of the face at rest. There was no hemianopsia. There was anesthesia to touch in the region of the left cheek

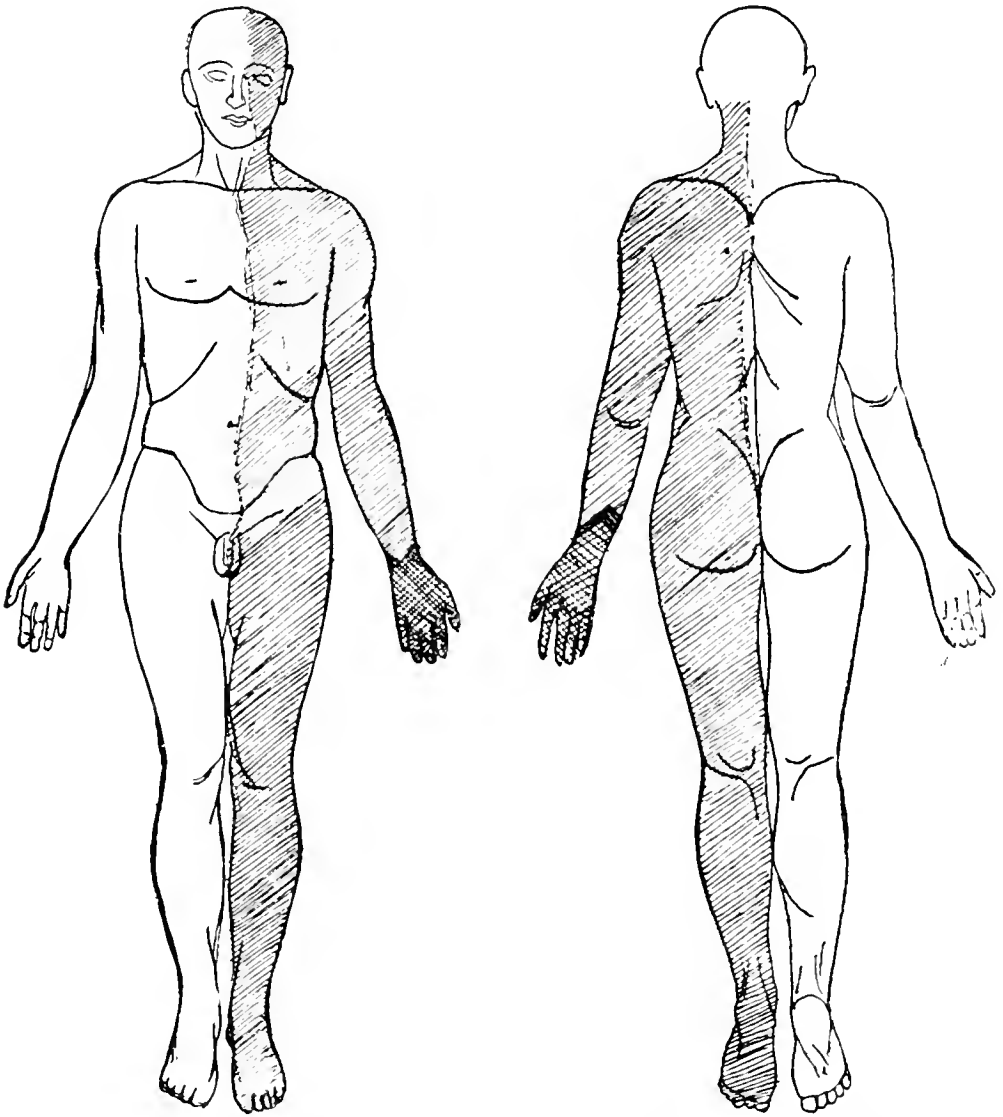


FIG. 1. Sensibility to Touch. Shaded area, Hypesthesia. Double shaded area, Anesthesia. Lines of demarcation not sharply defined.

and lower jaw which did not involve the left side of the nose and there was hypesthesia to pinpoint in the same region. He could raise the left arm slightly at the shoulder; could flex it weakly and could extend it with fair strength. The left hand was contractured, the thumb being flexed into the palm of the hand and the fingers flexed over the thumb. There was slight contracture

at the elbow in flexion. He could not move the fingers in any direction. The contractures could be passively overcome and there was no atrophy in the muscles. The biceps and triceps jerks were exaggerated. There was weakness in the movements of the left lower extremity especially the ankle and toes and there was considerable spasticity but no contractures and

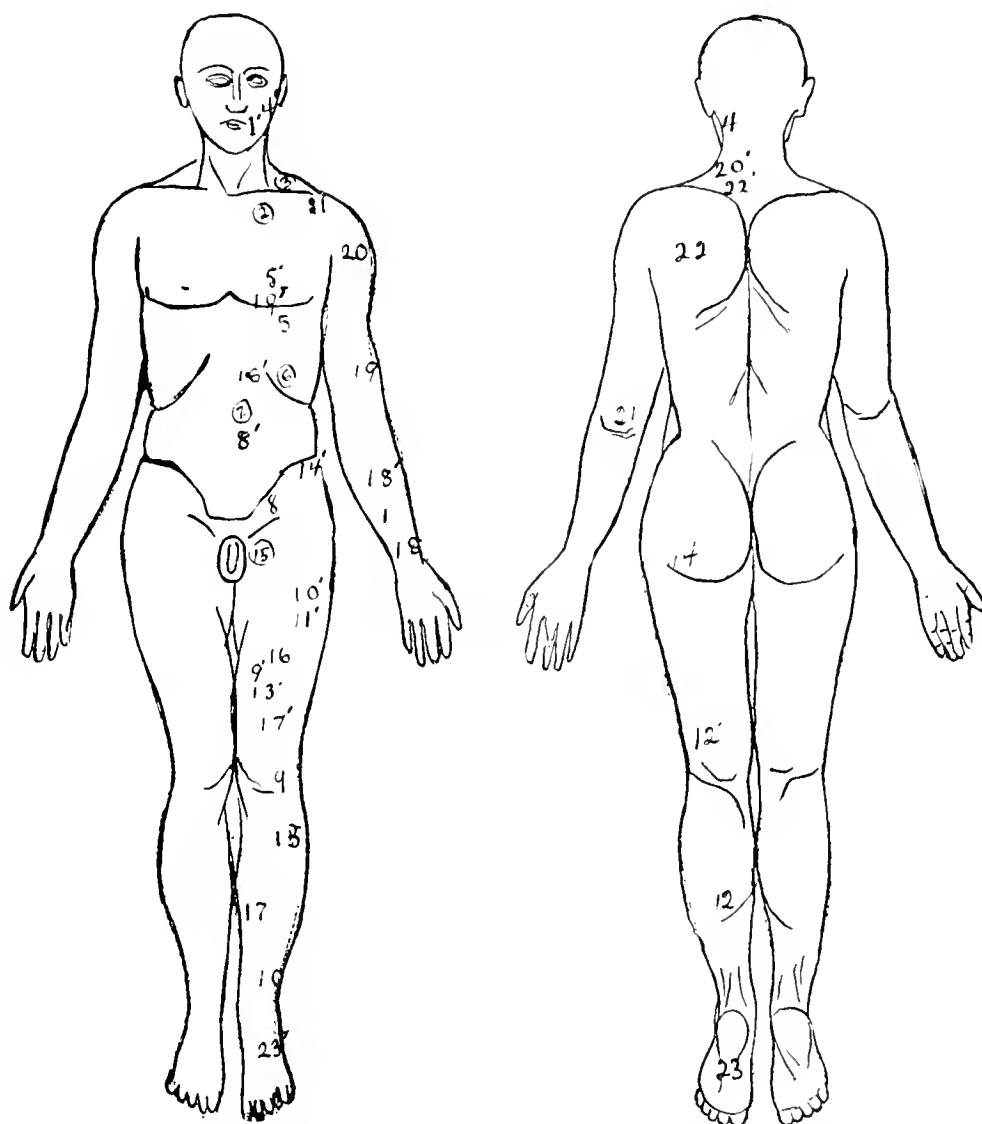


FIG. 2. Localization of Sensation. Numbers, Points touched. Numbers prime, Points located by patient. Numbers in circles, Points correctly localized.

no atrophy. The right leg had normal power. Plantar irritation caused flexion of all the toes on the left side and also on the right side. Plantar flexion was also caused by the methods of Gordon and Oppenheim, and of Shaffer. The knee jerks were somewhat exaggerated on both sides but especially the left. Ankle clonus was present on the left side but not on the right.

The cremasteric reflex was present on both sides and the abdominal reflex was present on both sides.

April 6, 1908, he was seen by Dr. de Nancrede, surgeon to the hospital, in consultation. Operation was suggested but refused and he left the hospital. The sensory changes which were found unchanged on repeated examinations are accurately shown in the

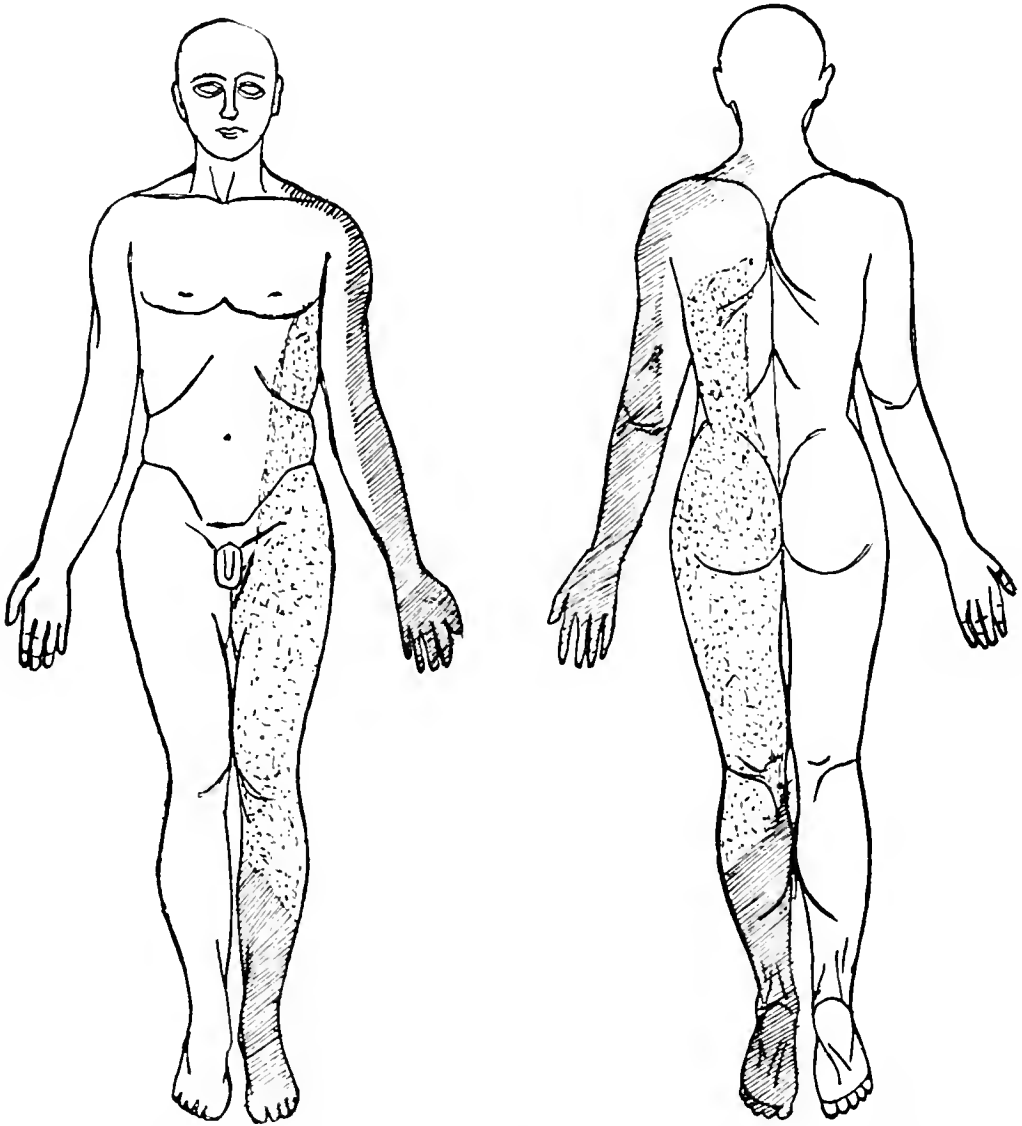


FIG. 3. Sensibility to Pinpoint. Shaded area, Analgesia. Stippled area, Hypalgesia, with peculiar sensation.

charts. On reference to the diagrams of the sensory changes it will be seen that the defect in the perception of tactile sensation involved almost the entire left side of the body, approaching the median line but not exactly reaching it. The hypesthesia in this case followed the rule in becoming more marked toward the distal portion of the extremities until, in the upper extremity, it reached a complete anesthesia just above the wrist. He was

able to appreciate touch in the left hand if any pressure was used. The patient spoke of a difference in the feeling caused by touches on the two sides of the body, the touches on the left side being felt more as tickling sensation. Tactile discrimination was much impaired on the left side; the compass points were not recognized as double unless separated six inches or more. There was a marked impairment of localizing sensibility as tested by naming the point touched. The amount of error was not constant but was more in the extremities than on the body and points near the median line were localized correctly. The direction of the error was toward the median line of the body. He showed no hesitancy in naming the points touched.

The distribution of the analgesia was peculiar in that the unaffected area on the upper chest and extending, tongue-like, down the inside of the arm was somewhat similar to the sensory areas of the first to the fifth dorsal segments, according to the sensory distribution of spinal segments as given by Starr (l. c.) and this area was the only part of the left side that was not affected. The total analgesia of the left leg gave place to a hypalgesia in the left thigh and left side of the lower chest and abdomen. In this area of hypalgesia the sensation was peculiar, inasmuch as while insisting that he did not feel the pinprick as such is still produced an intensely disagreeable sensation and the ordinary reflexes of pain. Deep pressure on the muscle masses of the left arm and leg was more painful, he said, than similar pressure applied to the right leg.

He called both hot and cold test tubes warm on the left half of the face and left half of the body. In the part of the body noted as anesthetic to touch he felt nothing. When both the hot and cold test tubes were placed on the chest at the same time he felt only the warm; did not feel two test tubes. The distribution of lost thermic sense did not correspond to the lost pain sense but occupied the entire left half of the body, coming very close to the median line.

Vibratory sensation was felt but not plainly over the external condyle of the left humerus and head of the left radius. It was not felt at all on the external condyle of the left femur, or the left patella, or the left external or internal malleoli. It was felt normally on the anterior superior spine of the left ilium, the spine of the left scapula, and the left side of the head and face. The sense of motion and the sense of position were both lost in the left wrist and finger joints, also in the left ankle and toes. Both were preserved in the left knee and shoulder joints. In the left elbow the sense of position was lost, motion was recognized but not its direction. There was no knowledge whatever of objects placed in the left hand.

It is evident from the history that in this case there was a lesion in the cerebral cortex. That there might also be a lesion deeper

in the brain in the basal ganglia cannot be denied, but the improvement in the symptoms which followed an operation, done some time after the injury, suggests that the lesion was confined to the cortex and subcortex; also the absence of hemianopsia in a case with such marked sensory symptoms would be against the location of the lesion in the internal capsule. The most marked disturbances were noted in the appreciation of light touch, the distinction between heat and cold, the discrimination of compass points and the localization of light touch, and these disturbances were greater in the extremities than on the body though there was no sharp line of demarcation. Vibratory sensibility and the appreciation of the position and movements of the fingers and toes were lessened on the same side. Sensibility to pain was not disturbed in the face nor in the first and second cervical segments but in an area which corresponds closely to the sensory distribution of the third cervical to the eighth cervical, inclusive, sensibility to pain was entirely lost. The perception of pain to pinprick was intact in the distribution of the first to the fifth dorsal segments inclusive. Below this there was an area extending well down on the lower limb below the knee in which pinprick was not perceived as such but as a most disagreeable tingling sensation. This area gradually shaded off into an area which included the lower half of the leg and the foot and which was totally analgesic.

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TWO CASES OF TUMOR OF THE PONS¹

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The two following cases are reported because they appear to me to be of much interest.

CASE I.—T. D., age five and one half years, was brought to me January 10, 1907, by his father, a physician living in Kentucky. He had had convulsions on several occasions when ill, the last time at the beginning of an attack of measles, when three years old. Otherwise he had been well.

The history of his illness is as follows:

On December 15, 1906, it was observed that the eyes were crossed. December 25, he cried with pains in the head. Since then he vomited occasionally, was constipated, was often drowsy and tired, and frequently sighed and yawned. The headache was not constant, but appeared to be increasing in intensity. The squint at first would come and go but was persistent the two weeks before I saw him. His physician states that the first week after symptoms appeared the pulse had been 60 to 65, but since then it had been mostly eighty.

At the time of my examination there was paralysis of the left abducens. Though the father stated that the child often stumbled, no other paralysis could be detected. The gait appeared to be normal, as were also the reflexes and optic disks.

The pulse was 96, temperature normal, appetite good, urine 1,020, no albumin, no sugar.

The boy was brought to me again on March 20, 1907. The symptoms had persisted. The headache was more continuous, but appeared to be less severe. He vomited less frequently. He was more drowsy and tired, so that he scarcely played at all. He could not bear noises, was emotional, and cried frequently. It was often observed that he appeared to choke in swallowing fluids. For two months some weakness of the right side had been observed, and this was on the increase. He was restless in sleep, and during sleep would occasionally have hemispasm, which would occur on the left (the non-paralyzed) side even more fre-

¹ Read at the thirty-fifth annual meeting of the American Neurological Association, May 27, 28 and 29, 1909.

quently than on the right. For some weeks he had had painful micturition, and passed only four to six ounces of urine daily. Examination of urine negative.

The examination on this date revealed a right hemiparesis, but the movements of the arm and leg were rather awkward than lacking in power. There was Babinski right, but no noticeable increase in the tendon reflexes. The tongue deflected toward the right. As to the face, at one time it would appear as though the left side was better innervated, at another time the right. The paralysis of the left abducens was unchanged. There was now distinct double optic neuritis with small hemorrhages into the retinae.

The child was brought to me the third time April 15, 1907. He had been getting progressively worse. His headache was more severe, his vomiting was more frequent, and his disability was increasing. There was still painful micturition, though the quantity of urine was normal, and there was nothing otherwise abnormal about it. On two occasions there had been strong retraction of the head.

At the time of this examination there was a more distinct hemiparesis. The right arm and leg were stiff and awkward, but there was also manifest loss of power, especially in hand and foot, and there was an increase in the tendon reflexes of the right arm. There was no increase of the tendon reflexes of the leg, but there was still Babinski right. The tongue deflected to the right. No facial paralysis could be determined, but there was not much facial expression. There was no impairment of sensation. Abducens paralysis as before. There was now very pronounced choked disk in each eye. Vision of left eye had quite recently become impaired. Vision of right eye normal. Hearing normal right and left. There was no pain on percussing the skull.

Hitherto there had been some wavering in diagnosis. After this examination I expressed the opinion that there was a tumor involving the left hemisphere of the cerebellum pressing upon the pons, and urged an operation. On account of a degree of uncertainty as to the exact seat of the tumor, and the doubtful issue, the father after first consenting, finally declined an operation.

On May 3, 1907, the father brought the boy to Cincinnati for an operation, as he believed that the child could otherwise live but a few days longer. He had had frequent attacks of retraction of the head and very severe headache; his swallowing had been worse, speech had become indistinct, and he could not sit up, for he could not hold up his head. When he tried to sit up the head would fall to one side or the other.

There was now, in addition, a lessening of the corneal reflex in the left eye, and to some extent in the right, and a distinct ankle clonus right. The mind had remained clear throughout.

At this time I stated to the father that the rapid increase and

severity of the pontile symptoms made it very doubtful whether they were due merely to pressure of a tumor from without. But inasmuch as there was doubt, he decided to give the child his one chance, if there were any.

On May 4, Dr. Ransohoff operated for tumor of the left hemisphere of the cerebellum. He failed to find anything, and the child died a few minutes after he was removed from the table.

The whole duration of the disease from the first appearance of symptoms was less than five months. Doubtless the child would have lived but a short time longer if no operation had been performed. The specimen was sent for examination to the Pathological Institute of the State of New York. The following is the report of Dr. Chas. I. Lambert.

The basal nuclei, midbrain and hindbrain corresponding to a Meynert's dissection was received in Kaiserling's fluid (No. 1). The specimen is mechanically somewhat distorted, due to tumor growth and fixation, the basal nuclei being flattened ventrally and the cerebellum dorsally. The medulla, pons, midbrain and crura have been somewhat telescoped on one another, especially in the neighborhood of the midbrain and crura, resulting essentially from a tumor growth in the pons. The right crus is torn almost completely through transversely, the left partially so, and both are considerably swollen. The pons itself is swollen and bulging and has a stiff jelly-like consistency. The basilar artery is overlapped by the adjacent bulging margins (see stained section). The left inferior margin of the pons is considerably more swollen than on the right side. The lower part of the medulla, including the olives, is rather firm and moderately swollen. Of the cranial nerves the left optic is compressed (perhaps fixation), the right is free; the third nerves are intact, the fourth were not found, the fifth are present, the sixth have been torn away, the seventh and eighth pairs are present and free from apparent involvement, as well as the remaining ones.

The right cerebellar lobe is fairly well preserved, the middle portion of the left and the posterior aspect of the vermis have been in part removed and the exact relations here have been obscured.

A transverse section was made through the middle of the pons and cerebellum through the roots of the fifth pair of nerves. The markings of the pons usually seen on its cut surface are obscured and are only seen in its more dorsal part. The cut surface of the tumor, particularly in the pons, presents an unusually moist and translucent, glossy appearance, much resembling an edematous condition. The tegmentum presents a slightly hemorrhagic appearance due to petechial hemorrhages. A transverse slice was taken at this level for sectioning. Other transverse cuts were made through the brain stem, but nothing beyond a diffuse tumor involvement of the normal tissues was observed.

as the normal morphology of the blood elements and absence of pigmentary changes would suggest.

Microscopically.—The cell types and character of the tumor matrix, the manner of growth and extension, and its relation to normal tissue elements, denote a glioma of a diffuse variety.

The area of maximum cell richness and tumor growth is in the pons itself, especially on the left side, the tumor process fading in intensity toward the periphery of the pons and cerebellum. Evidence of cellular activity and tumor growth in many places may be traced not only into the cerebellar arms on either side, especially the left, but even into the subdivisions and folia of the

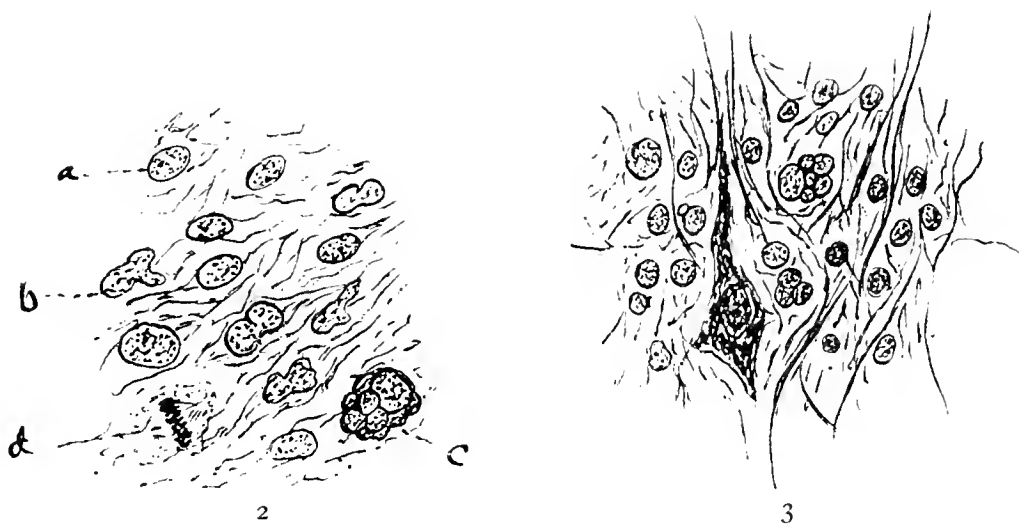


FIG. 2. A schematic picture of the tumor tissue and nuclear types. *a*, Oval forms; *b*, Lobate, etc.; *c*, Blackberries; *d*, Mitotic figure.

FIG. 3. A schematic drawing suggestive of the character of the fibrillar stroma, relation to nuclei and nerve cells.

cerebellum. In Fig. 1, at points indicated by *g*, *e*, *f*, such indications of tumor growth may be seen; only at occasional intervals islands of fairly normal tissue are seen, as in the left arm at *h*.

Study of the tumor tissue under the oil immersion shows a large variety of nuclear forms and divisions. A description of any one part of the tumor is fairly characteristic of the tumor as a whole. The richness in number and variety of nuclei is most apparent in the pons itself, the most probable center of the tumor growth.

For the most part the nuclei are round or oval and fairly rich in chromatin. Besides these there are a large variety of nuclear forms, from the oval to the angular and lobate forms or giant cells, whose nuclei, eight or ten in number, resemble a "blackberry" in their grouping. Numerous mitotic figures are seen in the various phases of indirect cell division, as many as two, three and even four having been seen in some of the microscopic oil-

immersion fields. Among these are numerous atypical mitoses with irregular and asymmetrical forms. In large part at least the tumor cells multiply by simple direct division.

The cytoplasm of the tumor as seen in the (hematoxylin and eosin) specimen stains a pale pink.

In the neuroglia stained preparation the nuclei are not so well stained, but the tumor's fibrillar matrix is somewhat better demonstrable and is seen to consist of a rather fine fibrillar stroma resembling normal neuroglia rather closely in its open mesh-like appearance. The nuclei appear to lie in the interstices of this mesh; only a few appear to have a definite cell body resembling the Deiters' or spider cell variety. In the neuroglia stained section the striation due to the pons fibers is plainer and medullated nerve fibers are easily seen.

In the several sections numerous nerve cells are seen with a well preserved cell outline, cell body and nucleus, but on account of the tumor growth have lost their normal group arrangement and relation.

SUMMARY

A gliomatous tumor of apparently rapid growth involves the medullary portions of the pons as well as that of the cerebellum almost symmetrically, but more especially the left side of the pons, which fact is evident both macroscopically and microscopically. The tumor cell type, although there are many polymorphous varieties of nuclei, the particular fibrillar character of the tumor stroma, the manner and mode of the tumor's growth, the absence of any definite capsular membrane, the relation of the tumor parenchyma to the nervous parenchyma (*i. e.*, nerve cells and nerve fibers), as well as to the purely mesoblastic elements, would warrant the anatomical diagnosis of glioma.

Summary Comment.—A boy of five and one half years, whose illness began five months previous to death, with headaches which varied in intensity and duration till the end, with increasing drowsiness and malaise. Paralysis of the sixth nerve appeared early in the course of the disease with later a progressive development of a right-sided hemiparesis, Babinski and finally ankle clonus. Optic neuritis diagnosed six weeks before death.

On May 4, at the time of operation there was choked disc, impaired vision and partial abolition of corneal reflex most marked in left eye, retraction of the head, indistinct speech, difficulty in swallowing, hemiparesis more marked, no sensory disturbances.

Clinico-anatomically.—The growth of the tumor was evidently very rapid, judging from clinical course, as well as the number of mitotic figures. The involvement of the pons was most extensive on the left side, directly and indirectly compressing the nervous parenchyma, both cells and nerve fibers, the left-sided ocular symptoms being most probably referable to compression of the optic and the involvement of the sixth nuclei or impingement upon the root itself by the tumor mass. The right-sided bodily symptoms seem to agree with the involvement and compression of the left pyramid in the pons tumor area, although the right pyramid was almost as extensively involved and one would expect almost as great functional disturbances on the left side of the body; the subjective disturbances are probably referable to the increased intracranial tension, thus the clinical and anatomical facts are in fair agreement.

CASE II.—In this case there was no post-mortem examination, but the history and symptoms scarcely bear any other interpretation than the diagnosis of tumor of the pons. The case is notable because of the almost clock-like progression of symptoms—very rapid withal—and the paralysis of almost all voluntary muscles before the fatal termination.

S. L. was 20 years of age, had good habits, and had never had venereal disease. He had been subject to migraine, having had attacks at intervals of a month or more, and for several years had suffered at times with indigestion. Otherwise he had enjoyed good health. He lived in Alabama and came to Cincinnati six weeks before I saw him, for the purpose of enjoying a vacation, his occupation being that of clerk in a store.

The first symptoms of his illness came on three weeks before I saw him. At that time he observed double vision. Nearly two weeks later he observed some weakness in the right arm and leg. Otherwise he had felt perfectly well.

He came to me July 20, 1908. The examination revealed paralysis of the left abducens, and very slight weakness of the right extremities. The latter was seen only in a slight difference in the grasp of the two hands, and in that the movements of the right toes, ankle and knee were less facile, possibly made with less strength, than on the other side. The cremasteric and abdominal reflexes were absent on the right side and present on the left. Otherwise as regards sensation, the special senses, the reflexes, the optic disks and the urine, the results of the examinations were negative. There were no subjective symptoms.

The diagnosis tumor of the pons was made and the patient was put to bed for the purpose of applying a vigorous course of

mercurial inunctions. The progress of the case was now rapid; the increase of symptoms, if not perceptible daily, could at least be seen every few days. For instance, a day or two after his first visit to me some of the small muscles of the hand were found to be weak, a day or two later others were weak; then, as these muscles were becoming weaker day by day, other muscles higher in the arm were found to be weak, their weakness also increasing day by day, until finally the hand was completely paralyzed, and later the whole arm. During this time the same changes were going on, though more tardily, in the lower extremity; the paralysis there, too, beginning in the distal part and extending upwards. Changes were going on also in the chest muscles. Shortly after the right hemiparesis began it was noticeable that on forcible breathing the right side of the chest did not move as much as the left, and some time later did not move at all.

During the time that the right side was becoming thus completely paralyzed other paralyses were appearing, in each instance beginning as a slight paresis and gradually increasing to complete or almost complete paralysis.

The paralyses that occurred, and their order, were about as follows: Paralysis of the left sixth nerve, of the right arm, leg, and right side of body, of the left seventh nerve, of articulation and swallowing, of the right sixth nerve, of the right seventh nerve, of the left side of body and left extremities, and a few days before death, of the left eighth nerve. So that finally there was almost complete paralysis of all voluntary muscles, when, as the result of the gradual failure of all vital functions, he died, September 10, ten weeks after the first appearance of symptoms.

In order to present this case more clearly to you I will give the notes taken on several occasions. The date of the first examination already given you is July 20, at which time there was paralysis of the left abducens and very slight right hemiparesis.

August 1. He is unable to move the right toes and foot, and has much lessened power at knee and hip. The small muscles of the right hand are completely paralyzed; other muscles of the right arm are much weakened. On deep inspiration right side of chest does not move as freely as the left side. There is paresis of the left facial nerve—he can not wrinkle the forehead on that side, can close the left eye but feebly, and can not move the left side of the face as well as the right. He has some difficulty in swallowing bread and like food, the difficulty appearing to be to get the bolus of food back into the fauces. There is a very slight change in his articulation of speech.

August 8. There is considerable increase in the paralysis of the left side of the face and of the right leg and arm, the arm being almost completely paralyzed. Occasional heightened muscular tonicity of the right arm and leg are observed. The

knee-jerk on the right side is somewhat in excess of that on the left. Swallowing is worse.

August 17.—Paresis of the right abducens. Paresis of the right spinal accessory—rotation and movement of the head toward the right less free than toward the left.

August 27. Great difficulty in swallowing. Speech so difficult that he has ceased to speak altogether. Feels some air hunger. There is complete paralysis of the right extremities and right side of the chest. Trace of ankle clonus right. Slight left hemiparesis; the left side of the chest does not move as freely as before in deep inspiration. In the left arm and leg there appears to be rather ataxia than weakness of muscles. The abdominal reflexes on the left side are abolished.

There is paresis of the right seventh nerve, all the branches being affected. The paralysis of the right abducens is complete. The muscles supplied by the left facial nerve, which began to get weak four weeks ago, and have now been completely paralyzed for some time, have been examined with electricity on a number of occasions with negative result. On this date these muscles respond to a weaker galvanic current and require a stronger faradic current to produce a response than do the muscles of the right side of the face.

September 7. The left hemiplegia has become quite marked. At times the right arm flexes strongly at the elbow and presses against the chest. The tongue lies motionless and shrunken on the floor of the mouth. When he opens the mouth the chin turns toward the left. There is some weakness of the sphincters of the bladder and rectum, so that their contents occasionally escape.

Hears the watch at a distance of five inches on the left side, and at ten inches on the right. (The hearing had been often tested and hitherto no difference had been noted.)

September 10. He died on this date at 11 P. M. For a number of days his pulse and breathing had been very rapid and he could scarcely swallow, so that his death had been expected daily. His hearing had continued to decrease, so that he only heard the watch in the left ear on contact. The left extremities had become almost completely paralyzed. His mind remained clear to the last.

When his speech became so difficult that he could hardly speak he began to speak in the deaf and dumb alphabet which he had acquired years before. As his left hand got weak he would point to letters on an improvised board instead of using the deaf and dumb alphabet. Then as his hand got too weak for that the bystander would point to the letter and he would nod his head yes or no. Finally he could not even nod his head.

Throughout his illness there had been no manifest impairment of sensation not even of the stereognostic sense.

The patient had been given in the beginning—for ten days—

inunctions of mercury, then he was given for a few weeks, gradually increasing and finally very large doses of iodide of potash. During the latter part of this period he complained somewhat of headache, which may have been due to the medicine. Subsequently his head much of the time was not comfortable, but one could scarcely speak of definite headache.

The patient's optic disks were examined quite a number of times, the last time twelve days before death. The result of the examination was always negative. Notwithstanding the absence of the cardinal symptoms of brain tumor, headache and optic neuritis, it seems to me no other diagnosis is possible in this case. Probably there was a soft infiltrating tumor which destroyed, and scarcely irritated, the nerve elements.

Society Proceedings

AMERICAN NEUROLOGICAL ASSOCIATION

THIRTY-FIFTH ANNUAL MEETING, HELD AT NEW YORK CITY, MAY 27-29, 1909

The President, DR. S. WEIR MITCHELL, in the Chair.

(Continued from vol. 36, page 743)

THE REFLEXES IN HYSTERIA

By Philip Coombs Knapp, M.D.

Babinski claims that hysteria has no influence upon the reflexes. Ankle clonus, loss of knee-jerk, and the Babinski and Oppenheim reflexes probably never occur in hysteria, but there is often a difference in the reflexes, both the skin and deep reflexes, on the two sides in hysterical hemianesthesia and hysterical hemiplegia. *(This paper will be published in full in the Journal.)*

Dr. Morton Prince said he was heartily in accord with Dr. Knapp in the position which he took in regard to the Babinski theory of hysteria. He did not believe that hysteria was merely a matter of suggestion, and in particular that the anesthesia met with was always a suggested anesthesia. There was no question that in hysteria there is a great increase of suggestibility and that, therefore, one can produce all sorts of symptomatic phenomena. One can produce not only artificial anesthesia and modify it, but one can often make a boundary line wherever one pleases, as Dr. Prince himself had done, but this does not show that there may not be an essential anesthesia in hysteria. This is borne out by several hypnotic experiments and certain states of dissociated personality, which are very important as well as interesting. It is well known that in certain hypnotic states the subject may go into a condition in which there is profound anesthesia. Also certain cases of dissociated personality have been characterized by anesthesia as well as paralysis. Now such hypnotic states and those of dissociated personality not only represent in principle identical conditions, but must be regarded as similar to the hysterical state. This is not to say that all hypnosis is hysteria, but only that certain hypnotic states are characterized by identical dissociated conditions.

Now given such subjects (and Dr. Prince stated that he had one at present) there may be absolute loss of all sensibility which cannot be modified by suggestion in any way. It is a condition of dissociation. In the subject referred to there is a loss in one hypnotic state of superficial and deep sensibility, and in another state there is loss of cœnesthesia. In neither can the condition of sensibility be modified excepting by changing the subject from one state to another or by changing the subject to the normal waking personality. If Babinski's theory is correct it should be possible to modify or remove the anesthesia in these states by suggestion, but this is not possible. The anesthesia is essential to the condition

of dissociation. The work which has been done during the past twenty years in dissociation confirms this view.

Regarding the condition of the reflexes in hysteria, the speaker said he could not give any statistical account from his own observations, but he agreed that frequently there was an increase of the deep reflexes. In one case he had seen an absence of the knee jerk on one side. It was a typical case of hysteria, a show case, which manifested many bizarre phenomena like temporary monocular polyopia, blindness and remarkable contractures of the limbs, which last could be removed and reproduced by suggestion at will. The loss of the knee jerk was persistent. The case was that of a young girl about sixteen years of age and there was no evidence of organic disease whatsoever. Dr. Prince stated that he could not explain the loss of the knee jerk, and if it was due to a complication he had not the remotest conception of what it could be.

Dr. Prince stated that he never saw the patient in a state of health. After remaining under Dr. Prince's care for a time she went to a homeopathic doctor who said she needed her ovaries out and did the operation. Dr. Prince had not seen her since. She may never have had a knee jerk.

Dr. Adolf Meyer said that a question asked suggested an important point, viz., whether any variability of reflexes had been observed and especially such as would be referable to the hysterical mechanism. He thought we were getting further and further away from simply assuming hysteria on the ground of some stigmata without due consideration of the mechanism. Whether or not there had been a real change in the reflexes, produced as other hysterical reactions are produced, would be the issue. Reflexes have been shown to be alterable under emotional conditions, and he thought that the matter should not be so very difficult to analyze if such a method as the one lately introduced by Prof. Dodge should be used. He thought Professor Dodge would be delighted to have his excellent method of reflex study brought into use.

Dr. Dana remarked that Dr. Knapp had stated that we have not any criteria of hysteria. Dr. Knapp thought a great many of us are coming to believe, as he does, that hysteria is only a peculiar reaction of the pathological organism, and does not represent in general usually any disease at all. However, there is a certain group of cases that we call hysteria which do present definite kind of symptoms and definite progress, and is perfectly recognizable. It is a condition about which none of us would disbelieve, that is the severe type which we see is characterized by sudden onset, with hemianesthesias and hemiplegias, a certain peculiar mental condition. Of these cases Dr. Dana has not seen more than 50 or 60 in the whole course of his practice, but that was one or two nearly every year. That is a certain definite type of hysteria which is just as much a disease clinically as typhoid fever or tabes dorsalis. All the other types are manifestations of a peculiar kind of reaction. He has made tests of the reflexes and has come to conclusions quite opposite to those of Dr. Knapp. Many years ago Dr. Dana reported a study of thirteen cases of that kind of hysteria, and in all of them he found the reflexes lessened on the paralyzed hemianesthetic side. Since then he has noticed the same condition. At present he has a perfectly typical case of that sort, a man who had an attack of hysterical apoplexy followed by a typical hysterical state, and he has had diminished knee jerk and ankle clonus. Dr. Dana has always taught that in hysterical states the knee jerks are rather diminished on the

affected side. It seems to him rather futile to attempt to state what are the symptoms of a disease of which we haven't any definite criteria.

Dr. Dercum said that we could hardly enter into a discussion of Dr. Knapp's paper without opening up a general discussion on hysteria itself, though this would take us somewhat far afield. However, to some extent it is unavoidable. There is unquestionably a natural history of hysteria. There are numerous facts, such as the predominance of the stigmata of anesthetic areas upon the left side, as well as the concomitance of the greatest contracture of the visual field with hemianesthesia of the same side, which indicate that there is some profound underlying cause. At any rate these facts are difficult to explain away on the theory of mere suggestion. Like Dr. Knapp, Dr. Dercum has found the reflexes commonly unequal on the two sides. Placing the legs in exactly the same position, he has in the majority of cases found the knee jerks plus on the affected side. Dr. Dana's findings are exceedingly interesting, and are possibly to be explained by difference in the method of examination. No doubt as Dr. Prince can limit an anesthetic field exactly where he wants it, so we can often modify the reflexes inadvertently by suggestions. The inordinate suggestibility of the hysterical subject must always be borne in mind, and yet there must be something in hysteria beyond this increased suggestibility. Is it not true perhaps that this very suggestibility depends upon a reduction of the field of consciousness? The increased suggestibility must be a secondary factor, it cannot be the primary one.

Dr. Hugh T. Patrick stated that this matter of reflexes is ordinarily not very difficult. He fancied that all have seen a difference in the knee jerks in the normal individual, depending upon the amount of tonus which the patient unconsciously passes into the muscles at the time the tendon is struck. Eliminating this is simply a matter of technic. The same thing carried a bit further has satisfactorily explained the difference in deep reflexes in some cases of hysteria. To put it another way, some hysterical patients apparently use reinforcement, unconscious reinforcement, in the paralyzed or parietic leg, others in the good one. This is owing to the mental attitude of the patient in regard to the paralysis. He often has succeeded in altering the exaggeration from one side to the other by influencing the patient's mental state in regard to the paralysis. Whether that explanation would apply to all cases he cannot pretend to state, but he is very sure it applies to a good many.

Dr. Morton Prince said he did not go into the subject of the nature of hysteria because he thought it was rather too big a subject to handle at this time, but in view of what Dr. Dana had said he would like to say that he has come more and more to the view that hysteria should be regarded as a clinical term; that there are a number of clinical syndromes which we have agreed to call hysteria. Hysteria as a term is comparable to clinical sore throat. Sore throat, a clinical condition, may be due to very different pathological processes and to infection from different organisms, and conversely the same pathological processes—diphtheria bacillus, for example—may give rise to very different clinical conditions in the throat. Consequently we speak of clinical diphtheria and pathological diphtheria.

So in hysteria we may have very different pathological processes present, such as dissociations, perverted associations, automatisms, sub-conscious activities, etc. Now the same pathological process may give

rise to very different clinical syndromes, and some of these syndromes by convention we are accustomed to speak of as hysteria and some not, and yet the underlying processes are the same. A dissociation may occasion an anesthesia, an amnesia, a Dämmerzustand, or something else; a perverted association may give rise to a localized pain or a complicated association neurosis like neurotic hay fever or a phobia; an automatism to a contracture, a tic, a psycholeptic attack, an hallucination, an obsession, etc. Thus the same psychopathological processes may be involved in different clinical syndromes and, vice versa, a given syndrome may involve very different processes.

When, therefore, we endeavor to compare cases of hysteria one with the other, with a view to determining the frequency of one or another symptom, we are really dealing with very different processes and necessarily our comparison leads to confusion and error. The speaker stated that he wished that the word hysteria could be got rid of entirely from our terminology and we could substitute terms which described the actual psychopathological processes present.

Dr. C. K. Mills said that he agreed entirely with Dr. Knapp in his presentation of this subject. However, he did not agree with the tone of the discussion in one respect. A report of a part of this discussion it seemed to him will simply add to the literature of indefiniteness.

One thing Babinski had done, which is of value so far as the symptomatology of hysteria is concerned, was to set more definite limits to this symptomatology.

He could not enter into the spirit of those who trouble themselves so much about the use of the word disease when talking about functional nervous disorders like hysteria; nor could he see any advantage in using such expressions as pathological reactions of the organism. Such a reaction seems to him after all in the proper sense to be disease or a disease, if the symptom complex is definite and one that repeats itself.

Dr. J. J. Putnam said he thought Babinski's attempt to reduce hysteria to an effect of mental "suggestion" was not a happy one. For one thing, the hysterical "dissociation" and reconstruction on new lines (automatism, etc.), is not wholly a mental but partly a physiological process. He had studied with care a case of hysterical immobility of one pupil, and believed that one physiological process may lead to another, after the analogy of a "suggestion," but without any intervention of the mind in a strict sense. It is not possible to produce hysterical loss of pupil reaction by ordinary suggestion. Such a case is more like what Dr. Prince has called "association neuroses." Of course if one accepts as "hysterical" only those symptoms which can be excited by suggestion, then it is safe to conclude that the sphere of hysteria and of suggestion are largely identical. But it is arbitrary and not enlightening to attempt this. Nutrition and the simpler reflexes are susceptible of being modified in hysteria. These modifications have their roots partially in mental processes it is true, but the results seen imply the working out of physiological principles, and if we would gain a comprehensive knowledge of hysteria we must study these principles. Suggestion alone will not explain why the anesthetics, and especially the hemianesthetics, have their peculiar distribution. The purely "mental" explanation is inadequate.

Dr. Knapp, closing, said that he did not at all have in mind bringing forward any definition or discussion of the nature of hysteria. Many of the gentlemen who had done him the honor to discuss his paper had

wandered a good deal from the particular points that he wished to bring forward. Neither did he attempt to limit cases of hysteria to the cases presenting hemiplegia and hemianesthesia. He simply selected these cases of hysteria which presented hemianesthesia or hemiplegia as cases most suitable for study, cases presenting unilateral symptoms, cases most suitable for the study of the question of these reflexes, particularly as the point had been made by the former writers that the reflexes were modified in just that class of hysterical cases and not in others. It seemed to Dr. Knapp that such suggestion as Dr. Meyer made, that the reflexes may be made to vary with the method of our examination, are a little far-fetched. They certainly can be. The reflexes do vary according to the method employed, but he thinks that many of us certainly are capable of examining the reflexes and determining whether they differ in the two sides in an ordinary case of hemiplegia, and whether they are diminished in the case of tabes. That is something we are supposed to know as part of our art as neurologists. We certainly are supposed to be able to make an accurate examination of the knee jerk and the plantar reflex, and Babinski has made this definite and positive claim that the reflexes are not altered. It seems the only way to meet the claim is to examine in a series of cases which may be fairly regarded as hysteria and by applying the same methods to them that we apply in testing reflexes in tabes or hemiplegia, to determine whether they are modified or not. That is what he had tried to do.

A CASE OF PRIMARY DEGENERATION OF THE PONS, CEREBRAL PEDUNCLES, MEDULLA, AND TO A LESS EXTENT OF THE CEREBELLUM; ASSOCIATED WITH PRIMARY DEGENERATION OF THE CORTICO-SPINAL TRACTS, WITH AUTOPSY.

By T. H. Weisenburg and S. D. Ingham, of Philadelphia.

A man of thirty-two, with an unimportant family history, developed a tremor of his entire body, with staggering and uncertain gait, headache and dizziness, followed by increasing weakness and spasticity of the lower and then the upper limbs and a gradual difficulty in talking, eating and swallowing, with involuntary laughing and crying. There was weakness of the tongue, palate, and facial muscles, but no fibrillary tremors or atrophy. Ataxic movements of the eyeballs were present early. The reflexes were everywhere increased with bilateral Babinski. The autopsy showed a primary degeneration of the pons, cerebral peduncles, medulla and cerebellum. There was, besides, a primary degeneration of the cortico-spinal motor fibers.

Dr. William G. Spiller read a paper with the title: Thrombosis of the Cervical Anterior Median Spinal Artery: Syphilitic Acute Anterior Poliomyelitis. (See this *Journal*, 1909, p. 601.)

Dr. Bernard Sachs said that Dr. Spiller's statements in regard to syphilitic anterior poliomyelitis were extremely interesting, but he thought Dr. Spiller would agree with everyone who has seen much of spinal syphilis that anything resembling a poliomyelitis in connection with spinal syphilis is an extreme rarity. Dr. Sachs said that he had thoroughly

studied this subject some ten or fifteen years ago, and at that period he had not seen a single case that could be relegated to this group. It seemed to him the only safeguard to put around one in endeavoring to interpret a condition of this sort during life is to insist that in addition to the special symptoms there should be some other symptoms pointing to constitutional syphilis, or else the clinical interpretation of a case might go very far of the mark. Examination of the blood that would point to constitutional syphilis would be in order before it would be safe to make a diagnosis of syphilitic anterior poliomyelitis. It is the same discussion that has been carried on for a long time as to the existence of syphilitic multiple neuritis, and will probably be settled by such cases as Dr. Spiller has reported, and no doubt authors had cases of this sort when they endeavored to describe what they thought were cases of multiple neuritis.

In regard to thrombosis of the blood vessels, this is very important. Dr. Spiller would recall that a number of years ago Dr. Sachs reported one case of paraplegia which was fatal, and autopsy showed that there was distinct thrombosis of the dorsolumbar blood vessel. There is no inherent reason why thrombosis which is so common in old age in cerebral vessels should not affect the spinal vessels. He thought Dr. Spiller had done a good service to call attention to this subject. Dr. Sachs stated that last year he and his assistant reported a case of thrombosis of the inferior cerebellar artery. He asked Dr. Abrahamson to give the result of that case.

Dr. Abrahamson said that the patient made a partial recovery. Six months later he had another apoplectic attack which left a left hemiplegia. He had a loss in the left fifth nerve distribution, dissociated from the rest of the right side of the body with the slightest kind of a hemiplegia on the right side. From this first attack he made a partial recovery. He is still alive after the second attack, but he is partly hemiplegic on the left side.

Dr. Spiller said he quite agreed with Dr. Sachs that the syphilitic anterior poliomyelitis is extremely rare. It would be impossible to make a diagnosis of syphilitic anterior poliomyelitis unless there were evidence of syphilis elsewhere in the body. In regard to syphilitic multiple sclerosis Dr. Spiller said that he had published a case with Dr. Woods bearing on this subject.

THE PATHOGENESIS OF TABETIC ARTHROPATHY BASED UPON THE ANATOMICAL AND HISTOLOGICAL STUDY OF TWO CASES

By Alfred Gordon, M.D.

A critical discussion of the advanced views concerning the etiology and pathogenesis of joint diseases in tabes. Two cases were studied clinically, anatomically and histologically. All the branches, without exception, distributed in the diseased articulations (knee and ankle), as well as the bloodvessels, were subjected to a careful microscopical examination. For the purpose of control, the nerves and arteries of the corresponding joints on the unaffected side were also examined. Deductions from this study.

PAIN IN TABES DORSALIS AN IMPORTANT DIFFERENTIAL DIAGNOSTIC POINT

By E. D. Fisher, M.D.

I. Pain is not often present in general paresis. II. When present, it is not of the characteristic type of tabes, *i. e.*, girdle, lightning, crises. III. Conclusions: It would seem as if the two diseases, for these and other reasons, are distinctly different in their characters.

Dr. F. W. Langdon said by way of preface that he views this subject from the standpoint of the non-asylum practitioner, more properly speaking, the neurologic and psychiatric standpoint outside of the hospital for the insane; therefore, what he had to say was not based primarily, at least, upon institutional observation. In the first place we are all familiar with the types of degenerative disease in which we see there is ascending tabes and descending tabes. In other words, a patient who begins with mental symptoms, whose knee-jerks and peripheral symptoms are not those of tabes but who after developing a typical paresis in cerebral centers, his pupils become unequal or irresponsive to the light reflex and we say the paresis has *gone down* and we have tabes. On the other hand, we have a patient with typical tabetic symptoms; a case that impressed itself upon him particularly was as follows: a patient who had been diagnosed as having typical tabes by so competent a man as Landon Carter Gray and had been under his observation for a long time, presented the slow development and suffered intensely from lancinating pains. He was competent mentally; he had charge of a large manufacturing business and Dr. Langdon had him under observation more than ten years. After six or eight years he developed rather abruptly paretic symptoms and his subsequent course was that of a typical paretic; he died after two or three years of paresis; so that Dr. Langdon could not say that a typical tabes never develops paresis.

As regards differences in the so-called lightning pains, that they are less likely to occur in paretics, Dr. Langdon thinks we can all concede that the sensibilities generally are diminished in paretics by reason of the affection of the cortex. Therefore there may be very reasonably a lessened amount of lightning pains in a man who is developing paresis when he has tabes. In a case he had especially in mind the lightning pains disappeared during the two or three years that typical paretic symptoms were present. Therefore Dr. Langdon could not subscribe to the view of Dr. Fisher that the two diseases are distinct. He thinks that the individuals who have one or other of the diseases are distinct individuals, and it is a question of vulnerability to the degenerative processes. Pathologically, this must at present be considered one process differently located; just as a man may have thrombosis in the cerebrum and thrombosis in the spinal cord, and both may be due to endarteritis and due to the same cause.

There is another point of practical importance the presence or absence of the *Bacillus paralyticans* of Robertson. The alcoholic, syphilitic, or the overworked theory will not account for paresis, since cases occur in which all may be excluded. Moreover, it is quite a regular disease in its evolution and it would seem probable that we must have some common universal cause where we have such a distinct disease to deal with.

Dr. Graeme M. Hammond said he could not attach the same impor-

tance to the pain symptom that his friend, Dr. Fisher did. We do not find in all cases of tabes sharp lancinating pain. In fact in one case he has now under treatment, a man of great intelligence, who has had tabes for the past ten years and has all the symptoms of tabes, including the classical Argyll-Robertson pupil not a single pain has occurred during the whole course of the disease.

On the other hand, Dr. Hammond cannot distinguish the pains that paretics complain of from the typical pains of many tabetics. They are sharp, lancinating in character in the legs or in the arms; generally in paresis they are in the arms as well as in the legs, but they are distinctly of the same type. A patient was brought to Dr. Hammond three years ago by a physician and the only symptoms he presented at that time were Argyll-Robertson pupil and sharp shooting pains in the legs. The physician who brought him considered the case one of tabes. He had absolutely no mental symptoms that could be elicited. During the three years since Dr. Hammond first saw him paresis had developed beyond the shadow of a doubt. Tabes has not. He has no signs of tabes either in gait or reflexes, but he still has the pains, and in three years he has developed undoubted symptoms of paresis. The symptom, therefore, of pain, to Dr. Hammond's mind, is not one which can be relied upon in making a differential diagnosis.

Dr. B. Onuf said he wished to call attention to some investigations that have been made by Mayer on spinal cords of paralytics, who had the tabetic forms of paresis. He found that the changes were not identical with those of genuine tabes. There was degeneration in the posterior columns but he concluded that these were not in the peripheral neurones but affected a second set of neurones which had their origin in the cells of the spinal cord.

Dr. Moyer wished to know what typical symptoms a tabetic ought to have. In so far as Dr. Moyer has examined cords he has not found typical changes. Last winter in his hospital service a man came with excruciating lancinating pains in the left leg, in which there was no ataxia, in the right leg there were both ataxia and loss of sense of position but no pain. Which leg had the typical tabes? Unquestionably tabes passes into paretic dementia not as commonly as is generally supposed, but undoubted cases are seen.

Dr. Fisher, closing, said he purposely made this statement as sharp as he could to bring out just the discussion which had taken place. He thinks that after ten years we will have a far more definite idea of what general paresis is than at present, and that many cases so reported will not be placed under that head.

In regard to what was said of the pupillary changes he thinks that is of vast importance. The pupil which is not the true Argyll-Robertson pupil is slow in reaction to light but is not what we classify under the head of true Argyll-Robertson pupil. We see it frequently in syphilitic cases, especially if associated with alcohol. It would not be sufficient, in his mind, for a positive diagnosis of general paresis, but still he would hold a pupil of that character as suggestive of general paresis.

In regard to another point made in discussion, Dr. Fisher thinks the character of the pain is so different, as in the cases related by the speaker, that it is not what he would call the typical pains of tabes. The mental condition in general paresis is not sufficiently impaired to

place aside the appreciation of pain, at least in the early stage of the disease. If slight irritation will excite anger, why should not pain be appreciated.

Dr. Hammond's remarks about patients without pain in tabes is, of course, a common history with us. We may find a patient with tabes where all the symptoms confine themselves to ataxia, and the reverse. We are speaking of patients who have pain, not those who haven't. Those irregular cases are the ones, as the case of Dr. Hammond, that are apt to pass into general paresis. Dr. Fisher has had such a case under his observation for six or seven years. It is an irregular case of tabes, and he expects the patient to pass in time into general paresis. He was glad to hear Dr. Onuf refer to the conditions found in the spinal cord in general paresis by Dr. Mayer, in which the lesion was diffuse and involved both the lateral and posterior columns—especially the former.

Dr. Sidney I. Schwab and Dr. Nathaniel Allison read a paper with the title: The Surgical Treatment of Athetosis and Spasticities by Muscle Group Isolation. (See this *Journal*, 1909, p. 449.)

Dr. E. D. Fisher said he happened to have this subject brought to his attention by an orthopedist recently; his idea was to cut the nerve supplying the spastic muscles.

Dr. Schwab said he and Dr. Allison were rather fearful of cutting the nerve. They felt that alcoholic injection would at least give the patient return of motion. The alcoholic injection really causes a functional paralysis; it is not a paralysis produced by a permanent anatomical lesion.

Dr. B. Onuf said he would like to say a few words about Dr. Schwab's introductory remarks. It seemed to him that it so rarely happens that we get therapeutic suggestions at meetings that when we can get such a suggestion he doesn't believe a speaker should be ashamed of it and make excuses for it. The remarks Dr. Schwab made concerning athetosis in reference to the favorable results which seem to occur after the paralysis of the opposing muscles has existed for some time are extremely interesting in connection with the fact that Dr. Onuf has observed that athetosis is essentially a symptom of disease which is acquired at a very early age. He has not seen a single case of athetosis in which the lesion which caused it was acquired in adult life. All the cases that he has seen were acquired in childhood, that is the hemiplegic, the cerebral lesion, which led to the athetosis, was acquired in childhood, and he tries to explain this to himself theoretically in this way: that he assumes that there was an interruption in the pathways between the cortex and lower centers, basal centers, and he assumes if these pathways are severed at an early date then these lower centers acquire a certain independence, presiding over movements, and are entirely independent of the will. If this be the case, then the only thing he can imagine is that if the offensive muscles are paralyzed for a period of six months these lower centers may again forget their function and then the cortical centers again gain their ascendancy.

Dr. Schwab, replying, said that in this case of athetosis they not only paralyzed the muscles, but also their sensory supply totally, because there is a theory that athetosis also depends upon the abnormal sensory impulses as well.

Dr. John Punton read a paper with the title: Hereditary Spastic Paraplegia. Report of Seven Cases in Two Families. (See this *Journal*, 1909, p. 588.)

OCCUPATION NEURITIS OF THE THENAR BRANCH OF THE MEDIAN NERVE

(A well defined type of neural atrophy of the hand)

By J. Ramsay Hunt, M.D., of New York.

A well defined clinical type of atrophy of the hand may result from compression of the thenar branch of the median nerve as it emerges from beneath the annular ligament of the wrist. This thenar branch is purely *motor* and innervates the abductor pollicis, opponens pollicis and the outer head of the flexor brevis pollicis. It is characterised clinically by a sharply defined thenar atrophy, limited to the distribution of the median nerve. The thenar eminence presents a scooped-out depression, lying between the outer boarder of the first metacarpal bone and the inner head of the flexor brevis pollicis muscle.

There are present also, the reactions of degeneration in the affected muscles; *and objective sensory disturbances in the distribution of the median nerve are absent*. This type of atrophy interferes very little with the general usefulness of the hand, as the other muscle groups are unaffected. The hand-writing may suffer considerably.

In connection with the *neural* atrophy of the hand muscles without sensory disturbances of median nerve origin (thenar type); Dr. Hunt calls attention to another well defined group of occupation atrophies of the hand described by him (*JOURN. NERV. AND MENT. DIS.*, 1908), which are dependent upon a compression neuritis of the deep palmar branch of the ulnar nerve as it passed between the tendinous origins of the abductor minimi digiti and the flexor brevis minimi digiti (hypothenar type).

In this type, all the intrinsic muscles of the hand are paralyzed, with the exception of those supplied by the median nerve. In the thenar type, objective sensory disturbances are also absent, the deep palmar branch of the ulnar being *motor*. The importance of these two types of compression (motor) neuritis, is very much increased from the resemblance which they bear to certain forms of the Aran-Duchenne type of spinal atrophy. This resemblance is enhanced by the well known fact that progressive muscular atrophy, beginning in the small muscles of the hand is not infrequent in connection with occupations necessitating an over activity of these muscles.

Dr. Hunt is convinced that cases belonging to one or other of these two types of occupation atrophy without sensory disturbances are not infrequently regarded as an early stage of spinal atrophy. Hence, their clinical and diagnostic importance.

HORIZONTAL OSCILLATION OF THE EYEBALL IN BELL'S PALSY

By L. Pierce Clark, M.D.; and H. H. Tyson, M.D.

Schlesinger's report. Bell's phenomenon. Differentiations of the horizontal oscillation signs from Stransky's associated nystagmus sign

and the reflex nystagmus of Bernheim and Baer. Horizontal oscillations of eyeball in the blind and in certain forms of catatonic stupor and excitement. Report of three cases of horizontal oscillation of the eyeball in Bell's palsy. Explanation of the sign—a central overflow impulse.

HOW SHOULD THE PAROCCIPITAL FISSURE BE REPRESENTED IN FISSURAL DIAGRAMS?

By Burt G. Wilder, M.D.

Commonly this and the parietal fissure are interpreted and represented as, respectively, the occipital and horizontal components of the intraparietal fissural complex. In apes and monkeys, young and adult, they are always continuous; the fetal conditions are unknown. In the human fetus they always commence independently and remain separate in about forty per cent. of hemispheres, but unite sooner or later in the other sixty. In many, perhaps most, of the cases of superficial continuity the original isthmus may be recognized as a more or less deeply submerged vadium or shallow, and it is a fair question whether cases in which the fissure at this point is less than one-half the greatest depth at either side should not be regarded as cases of separation rather than continuity. Superficial continuity is two or three times as common as separation on the left side, but on the right separation is more common, about fifty-five per cent. In the light of existing knowledge, the writer concludes that fissural diagrams should include the dorso-caudal aspect of this region, with continuity of the two fissures on the left and separation on the right; when only one lateral aspect is shown the fissures should still be separate but there should be a statement as to the conditions in the lower primates and in the human fetus and average adult.

THE HERPES ZOSTER OTICUS. A CONSIDERATION OF THE ZOSTER ZONES FOR THE GENICULATE GANGLION OF THE FACIAL AND THE JUGULAR GANGLION OF THE VAGUS

By J. Ramsay Hunt, M.D.

General anatomical considerations. Analysis of cases of herpes auricularis. Report of personal cases. An attempt to differentiate the zoster zones of the ear.

DREAMS AND THEIR INTERPRETATION AS DIAGNOSTIC AND THERAPEUTIC AIDS IN PSYCHOPATHOLOGY

By B. Onuf, M.D.

The merit of Freud's work in the interpretation of dreams. Analogies between dreams and hysterical states. Help of dreams in psycho-analysis. Dreams by suggestion, hypnotic and post-hypnotic. How to ascertain their completion by suggested landmarks. Diagnostic and therapeutic value of suggested dreams.

PELLAGRA, WITH REPORT OF EIGHT CASES

By Eugene D. Bondurant, M.D.

The nature of the disease; its symptomatology; especial consideration of the nervous and mental phenomena. Report of eight cases seen in private practice in Mobile.

The occurrence of pellagra in the United States, and the growing importance of the disease as a factor in the causation of insanity and other forms of nervous disorder.

MENTAL DISEASES CONSIDERED AS COMBINATIONS OF PSYCHOSES

By Edward Cowles, M.D.

In conscious experiences the formation of a concept is complex, there being, psychologically, "no psychosis without a neurosis," which implies a physiological process in combined reflex paths. In psychiatry there is no psychasthenia without neurasthenia with respect to conditions. A psychosis constituted of a symptom-complex combines its elementary psychoses in varying number, proportion, intensity, etc.; for example, in the melancholia-mania group there are more phases than two; and these may be varied by paranoid syndromes.

The changes of physiological condition (functional) of the melancholia-mania group may be associated with other graver clinical forms; in senile conditions with characteristic psychoses a transitory curable melancholia or mania may be added. General paresis, as a disease of the nervous system, may add to the onset of the characteristic dementia a transitory syndrome of the melancholic or manic type. In the involution psychoses, on the basis of whatever belongs to the climacterium, and casual structural changes, there may be a distinct syndrome of the melancholic, manic, or paranoid type. The dementia præcox group of deteriorating psychoses presents like combinations.

This method of analysis of "clinical pictures" follows from the genetic and developmental method on physiological lines, as opposed to the setting up of rigid clinical types.

MOTOR APHASIA WITHOUT LESION OF THE THIRD FRONTAL CONVOLUTION.

By F. X. Dercum, M.D.

The report is based upon two cases. Both presented the symptoms of a typical Broca's aphasia and at the autopsy no lesion of the third frontal convolution was found. Discussion of the significance of the findings.

PSEUDOMEMBRANOUS INTERNAL PACHYMENINGITIS

By D. J. McCarthy, M.D., and W. W. Hawke, M.D.

A consideration of pseudomembranes and proliferation of endothelial tissue; the relation of non-hemorrhagic pseudomembranes of toxic, irrita-

tive, and inflammatory processes. The causative influence of syphilis in the production of pseudomembranous formation and the occurrence of pseudomembranes in parasyphilitic conditions.

REMARKS ON SPINAL-CORD TUMORS.

By Pearce Bailey, M.D.

Results of five operative cases. Different forms of anesthesia in spinal-cord tumors. Value of disassociation as a sign. Absence of anesthesia as a bar to operation (three cases to illustrate this). Exception made for tumors situated within the sacral canal.

THE DANGER OF SUBTEMPORAL DECOMPRESSION IN CEREBELLAR TUMORS

By H. H. Hoppe, M.D.

Tachycardia, paralysis of the pharynx, convulsions, hemiplegia, death due to paralysis of respiration, following one another in rapid succession in eight days after the operation. Is suboccipital decompression more advisable?

LAMINECTOMY FOR POSTSYPHILITIC NERVE-ROOT PAIN

By Frank R. Fry, M.D., and Sidney I. Schwab, M.D.

A case of severe and intractable pain and paresthesia in the distribution of the fifth and sixth thoracic segments on the right side. The patient, a physician, had been infected with syphilis twelve years ago. The pain had persisted for nine months. Antisyphilitic treatment had been thorough. The laminectomy showed the fifth posterior nerve root extensively adherent to the dura, and it was removed. Patient died of shock. The postmortem examination showed the fifth to be the only root in which there were gross changes.

ON THE FEELING OF UNREALITY.

By J. W. Courtney, M.D.

This condition best studied in the psychasthenic. It comprises feeling of unreality of self and of outside world. Of these two feelings, that with regard to self is probably primary. Physiological versus psychologic interpretation of the phenomenon. Is the underlying pathology probably a cerebral vasomotor ataxia? Discussion of this question in the light of recent physiological investigations.

A CASE OF BRAIN TUMOR WITH UNUSUAL CLINICAL AND PATHOLOGICAL FEATURES

By B. Sachs, M.D., and I. Strauss, M.D.

A case in which a large tumor existed for several years, giving rise only to attacks of epilepsy.

ON THE CURABILITY OF CERTAIN PREPARETIC AND
PSEUDO-PARETIC CASES, AND THE IDENTITY OF
NERVOUS SYPHILIS AND PARASYPHILIS.

By Charles L. Dana, M.D.

The author gives the further history of cases having all the marks of beginning paresis reported four years ago. Other cases are now added. The types and symptoms that are favorable or the reverse. The frequency of depressive instead of expansive state preceding paresis in recent years, due, perhaps, to more vigorous mercurialization. Parasyphilis is best considered a quaternary stage of nervous syphilis.

A CASE OF SPINAL-CORD TUMOR.

By James W. Putnam, M.D.

The tumor, situated in the twelfth dorsal segment, was operated upon. Recovery of both motion and sensation.

A CONTRIBUTION TO OUR KNOWLEDGE OF THE IDIO-
PATHIC OTALGIAS AND THEIR SURGICAL
TREATMENT

By L. Pierce Clark, M.D., and A. S. Taylor, M.D.

(1) Historical sketch of idiopathic otalgias. (2) Anatomic structures involved. (3) Nature and prognosis of the neuralgias of the zoster zone of the geniculate ganglion. (4) Medical and surgical treatment. (5) Section of the posterior root of the geniculate ganglion as a means of relief of these neuralgias. (6) Technique of the operation by the cerebellar fossa route. (7) Report and presentation of a successful case.

Periscope

Journal de Psychologie, normale et pathologique

(Sixth Year. No. 3. May-June, 1909)

1. Heredity in Avarice. J. ROGUES DE FURSAC.
2. Pathological Reasoning and the Reasoning Psychoses. DR. HARTENBERG.
3. Various Fugues in an Obsessed Alcoholic; Conditions of the Fugue. R. BENON AND P. FROISSART.
4. On the Causation of the Unequal Valuation of Time. J. PERES.
 1. *Heredity in Avarice*.—This study is based upon twenty-five cases. The conclusions arrived at are:
 1. Morbid heredity is very frequent in the families of misers; as frequent as it is in the families of the insane generally.
 2. It assumes all possible forms (ascending, descending, etc.).
 3. The defects in the families of misers rarely consist of organic nervous troubles or of the neuroses properly so-called. On the contrary they consist almost entirely and exclusively of mental affections. The heredity is essentially psychopathic, this word being used in the largest sense as signifying a morbid state of the spirit or soul.
 4. Cases exhibiting anomalies of character predominate by far in frequency over the cases of psychosis properly so called, a fact which corresponds with what is observed in psychiatry generally.
 5. Similar heredity is frequent.
 6. Contrary heredity, though less frequent, is met with, the pure cases equaling those associated with similar heredity.
 2. *Pathological Reasoning and the Reasoning Psychoses*.—An interesting article upon the many varieties of paranoia, the varieties being made up largely of the peculiar forms of delusion present. Through them all, however, went the one clear indication of a false process of reasoning, due to the mental debility. The argumentation is systematized but unsubstantial.
 3. *Various Fugues in an Obsessed Alcoholic*.—A long and detailed report of a case of alcoholic psychic instability, chronic, with epileptiform crises and a variety of obsessions. One fugue was of obsessional origin, irresistible, conscious, and well-remembered. The other fugues occurred in a second state of consciousness and were followed by amnesia.
 4. *On the Causation of the Unequal Valuation of Time*.—An elementary discussion of the reason why sometimes a period of time seems long to us while at other times it seems short. The author thinks it depends upon the affective state of the subject, which is probably true and has been long recognized.

METTLER (Chicago).

Revue Neurologique

(Vol. XVII, No. 7)

- I. Lesions of the Axis cylinders of the Optic Nerve in Atrophy of Tabetic Origin. ANDRÉ-THOMAS.

2. On the Regeneration of Nerve Elements in Cerebral Softening.
PIERRE MERLE.

1. *Axis Cylinders in Tabes*.—The optic nerve, stained by the reduced silver method of Ramon Y Cajal, showed the axis cylinders that remained to be normal except at their point of entrance into the sclera. Here they were much thickened, at times bifurcated, and the finer fibers terminated in bulbous masses of protoplasm. These are explained as regeneration phenomena similar to those described by Nageotte as occurring in tabes in the posterior spinal roots. They are perhaps more rare in the optic nerve because the fibers contain no sheath of Schwann.

2. *Regeneration of Nerve Elements*.—The destruction of myelinated fibers in the process of cerebral softening is followed by an abundant production of fibrillæ. The fibrillæ present terminal masses but the "neurotisation" so constituted is limited and presents rather a phenomenon of cicatrisation than a new formation capable of reestablishing the functions of the nerve tissue.

(Vol. XVII, No. 8)

1. Bulbar Syndrome with Hyperexcitability of the Facial Nerve and Disturbance of Taste. F. RAYMOND AND HENRI FRANÇAIS.

2. The Argyll-Robertson Sign in Non-syphilitic Lesions of the Cerebral Peduncle. GEORGES GUILLAIN, ROCHON-DUVIGNEAUD AND J. TROISIÈRE.

1. *Bulbar Syndrome*—Paralysis of the Millard-Gubler type, paralysis of the sixth and seventh cranial nerves on the right side and of the extremities on the left side, exaggeration of the tendon reflexes and a Babinski reflex on the left side. The facial palsy was of the peripheral type, involving both the upper and lower portions, but was accompanied by a hyperexcitability of the muscles to the faradic current. There was a loss of the sense of taste in the anterior two-thirds of the tongue on the right side, without any change in common sensibility which proves that the taste fibers pass through the intermediary nerve of Wrisberg to their central termination.

2. *Argyll-Robertson Sign*.—The authors state that the Argyll-Robertson pupillary sign is often regarded as pathognomonic of syphilis either inherited or acquired. Two cases are reported in which the sign was present with no indication of syphilis. Both cases were examples of Weber's syndrome, the first, caused by a pistol shot and the second an apoplexy. The sign occurred in the eye in which the third nerve palsy was present, the reaction of the pupil in convergence being preserved while it was lost for light.

(Vol. XVII, No. 9)

1. Persistence of the Cranio-pharyngeal Canal in two Acromegalic Craniums; importance of these New facts in Relation to the Pathogenesis of Acromegaly and of Analogous Syndromes. ETTORE LEVI.

2. Dystrophic Symptoms and the Temporary Pathological Diminution of the Galvanic Excitability of the Muscles in Myasthenic Paralysis. ALEX. STCHERBAK.

1. *Acromegaly*.—In two acromegalic craniums in the museum of pathological anatomy at Florence the sella turcica is seen to be much enlarged and there is a canal from the dorsum sellæ to the pharynx. The facts cited favor the theory that acromegaly bears a relation to changes in the hypophysis.

2. *Myasthenic Paralysis*.—The patient showed: ocular palsies, dysarthria of bulbar type, paresis in the distribution of the facial nerve, troubles in deglutition and mastication, paresis of the muscles of the trunk, shoulders and pelvis, slight atrophy of the trapezius and deltoid muscles, myasthenic electric reactions in the triceps and biceps muscles and a simple diminution in the galvanic excitability of these muscles without qualitative change. Local "Arsonvalization" to the paretic muscles of the trunk and shoulder was followed by some improvement.

(Vol. XVII, No. 10)

1. Contribution to the Study of Spinal Motor Localization in a case of Scapulo-humeral Disarticulation in Infancy. MONSIEUR AND MADAME DEJERINE.
2. Troubles in Motility in Thomsen's Disease. BRISSAUD AND BAUER.

1. *Spinal Motor Localization*.—The disarticulation of the right arm occurred at the age of four years and the patient was forty-eight years old at the time of his death. The examination of the spinal cord showed some atrophy of the anterior horn on the right side in the cervical region but a very considerable preservation of nerve cells. The authors explain this as consistent with the existence of nerve fibers in the stump of the nerves even though these fibers had no particular function. The long duration of the condition, forty-four years, made the material unfavorable to elucidate the question of spinal, motor localization.

2. *Thomsen's Disease*.—The author insists on two facts as essential from the point of view of the clinical pathological physiology of this disease: first, the facility of a first contraction but the slowness of the ("de contraction") relaxation; second, the synergic contraction of antagonistic muscles.

(Vol. XVII, No. 11)

1. Anatomical Study of a Fourth Case of Amyotrophic Lateral Sclerosis, a propos of the Localization of the Motor Corex. ITALO ROSSI and GUSTAVE ROUSSY.
2. On Some Alterations of the Anterior Roots in Tabes Dorsalis. ANDRÉ THOMAS.

1. *Amyotrophic Latcral Sclcrosis*.—The authors arrive at the same conclusion as from the other three cases: that the ascending frontal is the chief motor convolution; that the anterior part of the paracentral lobule, the operculum and the foot of the first and second frontal convolutions participate equally in the motor zone; and there is probably a very slight participation of the ascending parietal convolution.

2. *Anterior Spinal Nerve Roots in Tabes*.—Changes in the anterior roots resembling those described by Dejerine and Sottas as occurring in hypertrophic interstitial neuritis of infancy. These changes occurred in cases presenting muscular atrophy and were present in the roots supplying the atrophied parts.

CAMP (Ann Arbor, Mich.).

Brain

(Part 125, Vol. 32. May, 1909)

1. On the Exact Origin of the Pyramidal Tracts in Man and Other Animals. GORDON HOLMES and PAGE MAY.

2. A Note Upon the Faradic Stimulation of the Postcentral Gyrus in Conscious Patients. HARVEY CUSHING.
3. On Certain Cases of Acute Tremor Occurring in Children. R. MILLER.
4. A Clinical Study of Optic Neuritis in its Relationship to Intracranial Tumors. LESLIE PATON.

1. *Pyramidal Tracts*.—Notwithstanding the general idea that the exact cortical origin of the pyramidal tracts is an established fact, Holmes and May believe that such is far from being the case. They, therefore, have made a very elaborate and interesting study partly reported on in this excellent paper. They utilized the *réaction à distance* degeneration method with Nissl modifications to study the cellular alterations. After division of the motor pyramidal fibers in the upper cervical region of the spinal cord there appears reactionary chromatolysis and atrophy of the cells in the cerebral cortex from which these fibers take origin. By operating thus on a series of animals (cat, dog, lemur, monkey and chimpanzee) and by utilizing two suitable cases in man, it has been possible to attain by histological methods the following conclusions: (1) The exact area of the cerebral cortex from which the cortico-spinal fibers subserving the limbs and trunk take origin is that shown in our figures and described in our text (original to be consulted for full details). In primates this area lies entirely in front of the Rolandic fissure. In the two human brains examined the posterior limit of the area, from which they have shown that the cortico-spinal fibers take origin, never crossed the bottom of the sulcus, but in a few of the many hemispheres, normal and pathological, in which this region has been examined by one of them, the giant-cells, from which they show the cortico-spinal fibers spring extended behind the fissure and in one case almost reached the apex of the posterior central gyrus. In fact, as Schäfer, Sherrington, Elliot, Smith, Vogt and Brodmann have insisted, the relation of even the chief fissures to homologous cortical areas is by no means constant even in the same species, and their importance in cortical localization may be consequently overrated. The posterior central (ascending parietal) gyrus is in no way concerned with the origin of the motor (pyramidal) fibers subserving the limbs and the trunk. (2) These cortico-spinal fibers arise only from the giant pyramidal cells of the infra-granular layer of this portion of the cortex, and these cells probably give origin only to cortico-spinal fibers. (3) The area of origin of these cortico-spinal fibers coincides closely with the "excitable motor cortex" subserving the limbs and trunk, as this has been mapped out by recent investigations. (4) This area of origin of the cortico-spinal fibers is co-extensive with part of a structurally differentiated cortical field.

2. *Post Central Gyrus in Conscious Patients*.—The following is the author's summary of this striking contribution: Two patients, afflicted with epileptic attacks inaugurated in each instance by a sensory aura in the right hand, offered unusual opportunities, as related, for cortical stimulation while in a conscious state during a "second-stage" operation. In both of them the situation of the central fissure was determined by obtaining characteristic motor responses from the precentral gyrus, these motor responses being attended by no sensation other than that of the forced change of position which accompanies similar movements elicited by stimulation of a peripheral nerve. On the other hand, in both of these patients stimulation of the post-central convolution gave definite sensory impressions which were likened in one case to a sensation of numbness, and in the other to definite tactual impulses. In both of the patients,

furthermore, stimulation of the outlying convolutions gave no response whatsoever, either of a subjective sensation or of active movement.

3. *Acute Tremor in Children*.—Six unusually instructive cases of acute encephalitis (poliomyelitis in some) with acute onset, hypertonus and acute tremor, with at times involvement of some other part of the nervous system of other than the cerebello-cerebro-spinal tracts. The individual cases should be read *in toto*.

4. *Optic Neuritis and Cranial Tumors*.—This paper is based on the clinical records of the National Hospital between the years 1900–1907, including the cases of cerebral tumors admitted and confirmed post mortem or surgically. In all some 400 histories are reviewed.

The *incidence* of the neuritis is summed up as follows by the author: (1) When a tumor directly or indirectly exercises constant pressure on the chiasma or on the optic nerves it is likely to cause a primary pressure atrophy without any preceding edema of the disc. (2) Some cases of meningeal tumors where the brain substance is not invaded do not develop optic neuritis. (3) There are two regions of the brain—the pons varolii and the white matter of the cerebral hemispheres—in which tumors frequently develop without causing optic neuritis.

As to the *severity* of the neuritis the amount of swelling as measured by the height, the venous turgescence and capillary congestion, offer fairly reliable guides. Along with the hemorrhages and also dependent on the degree of venous congestion present there sometimes appear dusky, yellowish, patches of exudate. An equally important component of the picture is the extent to which the neighboring retina is affected by the spreading of the edema from the neighborhood of the disc. In a definite proportion of the more severe cases the presence of the spreading edema is manifested by the formation of what is known as a macular fan. This feature is a very definite evidence of neuritis of a gross character, and never appears with the lower degrees of swelling, whereas hemorrhages occasionally show themselves in cases of neuritis which cannot in any way be described as severe and in association with swelling of quite a small amount. The average swelling calculated from all the cases with hemorrhages varies but little from the general average of swelling met with in all cases, whereas the general average in cases with macular figures is 0.6 diopter higher.

Visual loss is very unsatisfactory. The following conclusions the author offers as tentative as to the location, incidence and severity: (1) Precentral tumors are nearly always associated with neuritis fairly severe in character. (2) Postcentral tumors are nearly always associated with neuritis, as a rule moderate, and often of very short duration. (3) Temporo-sphenoidal tumors are always associated with neuritis of about the same degree of severity as in frontal tumors. (4) Of sub-cortical tumors about one half develop neuritis—as a rule, moderate in degree—and, as in the case of parietal tumors, frequently of short duration. (5) Optic thalamus and mid-brain tumors are almost invariably associated with optic neuritis of very great severity. (6) Cerebellar tumors are constantly accompanied by neuritis of a grave character. (7) Extracerebellar tumors, as a rule, develop neuritis of a grave character.

As to the relationship of grade of neuritis and the site of the tumor, the author concludes that a difference in the amount of neuritis on different sides is not a sign of localizing value, neither is there anything in the nature of the tumor which determines the onset of the neuritis. Increased intracranial pressure alone is not the necessary cause of the

neuritis. It is possible, he writes, that the increased pressure and the neuritis are two concurrent results of one common cause.

The author's general summary is of further interest as follows: (1) Tumors directly or indirectly exercising constant pressure on the chiasma, or on the optic nerves, may cause primary pressure atrophy without any preceding edema of the disc. (2) The great majority of tumors affecting the grey matter of the cortex cerebri have optic neuritis, the severity of which seems to vary inversely with the distance of the part affected from the chiasma; (3) Tumors lying deep in the white matter of the cerebral hemispheres do not, as a rule, develop optic neuritis until they invade either the cortex or the basal ganglia. They are most likely to develop optic neuritis when they spread in the latter direction. (4) Tumors affecting the optic thalamus, the mid-brain, the cerebellum and the ventricles are almost invariably associated with optic neuritis. (5) Pontine tumors and some extra-cerebellar tumors which are closely allied to pontine tumors do not develop optic neuritis until neighboring regions, especially the cerebellum, are invaded. (6) A difference in the intensity of the neuritis in the two eyes is met with in about 50 per cent. of all cases. The neuritis in some cases is greater in the eye on the side of the tumor, and in some cases is greater in the opposite eye. When a difference exists it should not be regarded as of localizing value. (7) The nature of a tumor does not in itself play any part in determining the onset of the neuritis, except in so far as the nature of the tumor determines its location. (8) A close relationship seems to exist between the occurrence of neuritis and the amount of intracranial tension, but there is as yet nothing to justify us in saying that the relationship is one of cause and effect. (9) Meningeal inflammation is rare in cerebral tumors, and when it does occur is, in the majority of cases, localized to the actual tumor area and plays no part in the causation of optic neuritis. (10) There are reasons for thinking that the diminution of visual acuity and the edema of the optic nerve-head are more or less independent of one another, and are not related to one another as cause and effect. (11) The atrophy of the nerve in some cases at least is probably a simple pressure or descending atrophy starting from the chiasmal end of the nerve and exactly analogous to the primary atrophies that occur quite apart from any edema of the disc. (12) Age in itself has little or no relationship to the occurrence of neuritis.

JELLIFFE.

Deutsche Zeitschrift für Nervenheilkunde

(Band 35, Heft 1 and 2)

1. The Past and the Future of German Neuropathology. ERB.
2. A Study of the Genesis of Conjugate Deviation. RÖNNE.
3. The Phenomena and Basis of Word-deafness. QUENSEL.
4. Impairment of Memory and Intellect from Toxins of Gastric Origin. PLÖNIES.
5. Clinical and Anatomical Studies of Six Cases of Pseudo-systemic Disease of the Spinal Cord. NONNE and FRÜND.
6. Further Study of Torticollis Mentalis. KOLLARITS.
7. Contribution to the Subject of the Peripheral Medullated Nerve Fibers. WALTER.
 1. *German Neuropathology*.—Of historical interest.
 2. *Conjugate Deviation*.—(Continued).

3. *Word-deafness*.—Reports three cases and reviews the literature.

Case I showed a complete loss of word-understanding, yet word-hearing and the ability to repeat words were retained in varying degree. He had the capacity to read aloud, but no idea of the content; he could copy, and in a limited degree write from dictation. The picture resembled the trans-cortical sensory aphasia of Wernicke. Necropsy showed besides a lesion of the third left frontal convolution, three other lesions, one in the angular gyrus, another in the supra-marginal gyrus, and a third in a similar area in the opposite hemisphere.

Case II showed word-deafness, alexia and disturbance of spontaneous speech, and agraphia.

Case III showed progressive developing symptoms of aphasia, besides a right hemiplegia.

After discussing the symptoms and pathology he concludes as follows:

(1) The posterior half of the first temporal convolution, together with the transverse temporal gyrus are affected when word-deafness occurs. The left cortex in right-handed patients and *vice versa* in left-handed people. (2) Total word-deafness occurs: (a) In cases with a subcortical lesion and total interruption of the auditory radiation, and of the corpus callosum in the word-hearing zone. Partial interruption of the auditory pathway, with total interruption of the transverse and first temporal convolutions, leaves word-hearing and the word-understanding intact. (b) Complete word-deafness occurs in a lesion entirely or partially cortical, when the left transverse gyrus is isolated or affected by a large lesion. (3) Cases in which the transverse temporal gyrus is more or less completely involved, show a varying degree of word-deafness, with the capacity of pronouncing one or two syllabled words correctly, paraphasia in the repeating of others. (4) The power of repeating words fails in incomplete word-deafness only when at the same time there is a lesion in Broca's area. (5) Intact ability in repetition of words in word-deafness indicates that the outer portion of the transverse temporal, also a considerable portion of the first temporal convolution remain intact. However, inversely the function may not be present, even though the above area is involved. (6) Disturbances of reading are not necessarily bound up in the destruction of the above circumscribed region of word-deafness. At the most a loss of the understanding of what is read can be expected, with intact reading aloud. (7) Complete or partial alexia, with exception of the form mentioned under (6), is found in cases where the lower parietal region is involved, especially the angular gyrus. (8) Disturbance of the ability to repeat words heard, and of reading, are not in any ratio to the degree of word-deafness. (9) Amnesic and paraphasic disturbances of spontaneous speech are rarely absent in word-deafness. (10) The spontaneous writing capacity in word-deafness depends upon (a) disturbance of spontaneous speech, and (b) disturbance of reading. Inability to write to dictation depends on (a) the condition of spontaneous writing, (b) the extent of word-deafness. (11) When the ability to copy is destroyed in word-deafness it indicates either a total alexia or often a coincident motor aphasia. (12) Apraxic symptoms in word-deafness indicate that the anterior portion of the gyrus supra-marginalis is affected. (13) The following holds for the well-defined forms of word-deafness: (a) Pure word-deafness occurs as a clinical syndrome. Only one case has been shown where a sub-cortical lesion was found. (b) The trans-cortical sensory aphasia of

Wernicke is observed as a clinical syndrome, mostly transitory, and due to diffuse processes. No definite stabile focal symptoms have been established. (c) The variable clinical character of the so-called cortical sensory aphasia makes its existence doubtful; its phenomena vary according to the situation of the pathological lesions. (14) The classification of word-deafness is most satisfactory from the clinico-anatomical standpoint. In the cerebral cortex there is found a relatively widespread association area, serving mostly for the association of auditory speech functions. Into this region enter the auditory projection fibers. This area (the transverse temporal gyrus) forms an end and relay station. All word-deafness, due to a deep peripherally situated lesion, may be called pure perceptive. This form is always complete, pure and usually stabile. Word-deafness produced through a central lesion is just the opposite—incomplete, complicated and labile, and capable of a return of function. Pure association form—the more or less complete involvement of the transverse convolution produces the mixed forms of perceptive, associative word-deafness. This may be partial or complete; it differs from the pure perceptive form in being complicated, at least with spontaneous speech disturbance, and it is separated from the pure associative form in the limitation of the power to repeat words. (15) The conditions under which word-deafness may improve, but rarely heal entirely, cannot be stated with certainty. In the stabile forms there often occurs bilateral destruction of the word-hearing regions, sometimes a unilateral destruction of the transverse gyrus, involved in a wide spread lesion. Probably the corpus callosum plays an important part. Not all cases can be explained from the anatomico-physiologic view. The age of the patient, length of development of the disease, general condition of the brain, the peculiarities in the action of both hemispheres. In the healed cases the area causing word-deafness was never totally destroyed on both sides. Improvement has been observed in cases where there was one-sided total destruction of the suspected area.

4. *Memory and Gastric Toxemia*.—The sharpness of the memory pictures and the ability to recall them depend in part upon the durability of the molecular arrangements in the ganglion cells, and especially upon the area of associated connections. With this theoretical and anatomical basis for the conception of memory Plönies endeavors to show the effect of toxins upon this memory framework, and then endeavors to prove by a series of analysis of many individuals that the toxins most detrimental in the production of memory weakness are those of gastric origin. These according to him surpass even the toxic effects of diabetes and chronic nephritis. He endeavors to show the relationship of the toxic action to the memory weakness in the results of treatment upon these various grades. He gives a table comparing the various grades of memory weakness to the strength of the toxicity. This he believes indicates a clear and direct relationship. In mental workers the onset of memory weakness is later than in laborers and craftsmen. In the intenser form of memory weakness the author finds a higher percentage of women affected. This he explains by the higher grade of the toxins, and a limited ability on the part of the brain to withstand toxins. In these tables he has excluded all cases of alcohol, lead, syphilis, diabetes, etc. Also he attempts to show that malnutrition and anuria play little or no part so long as no toxin is present.

5. *Pseudo-Systemic Disease*.—Erb and Charcot first recognized

multiple degenerations in the spinal cord, though Kahler and Pick gave them their systemic picture. Systemic diseases were divided into two groups, hereditary and acquired. To the former belong Friedreich's ataxia, and the hereditary spastic spinal paralysis of Strümpell and others. The acquired forms have been described as tabes, pseudo-tabes, ataxic paraplegia, etc. The acquired form may be divided into the true system and pseudo-system diseases. Later observations indicated that the true system diseases at least clinically represented no simple picture, and that no sharp distinction could be made between the pseudo and true system forms. Nonne and Fründ discuss this question as to whether there is justification, clinically or anatomically, for this sharp distinction between the pseudo-system and true system diseases, excluding tabes, which they believe to be a specific disease. Their conclusion is that there is no reason, for such a distinction. They report six cases. Cases 1 and 2 represent the picture of a systemic disease, case 3 shows a transition form, while 4 and 5 and 6 are diffuse forms. In the material examined scarcely two cases showed similar clinical or pathological findings. The following is a résumé:

Case 1. No clinical history. Pathological change in spinal cord consisted chiefly in symmetrical degenerations of the posterior and lateral columns.

Case 2. Clinical history. Patient æt. 56, without hereditary history, complained of gastro-intestinal disturbance three years before onset of his illness. Syphilis negative. Alcohol to excess for three years. No pains, no paresthesias. Flaccid paralysis of the legs. Tendon reflexes lost. Babinski positive. Towards the end ataxia and weakness of the arms, and marked sensory disturbances. Early bladder and rectal trouble. Pupils normal. Severe anemia. Microscopically, the cord showed focal scleroses in the posterior columns in the lumbar area, systemic degeneration of Goll's columns in the thoracic and cervical area; besides, sclerotic foci in Burdach's column in the cervical segments. Symmetrical involvement of the lateral pyramidal tracts and the posterior cerebellar tracts. Gray matter of anterior and posterior horns normal, save the cells of Clarke's column, which are atrophied. Marked changes in the blood vessels. Duration of the disease ten months.

Case 3. Severe anemia two years before onset of the spinal disease, shortly after iritis. For a year and a half patient felt well, then there developed weakness and stiffness of the limbs. Syphilis and alcohol denied. Pupils normal. Gait spastic ataxic with increased deep reflexes. No sensory changes at first. Bladder normal, later paralyzed. Severe pains and girdle form in disturbance of sensation. Moderate anemia. Duration eight months. Microscopical: Focal sclerotic areas in posterior columns of lumbar segments, nearly symmetrical in lumbar swelling, symmetrical in thoracic segments. In the cervical segments symmetrical degeneration of Goll's tracts, new foci in Burdach's. The crossed pyramidal tracts show symmetrical degeneration, beginning slightly in the lumbar and becoming more marked in the upper cervical. This degeneration could be traced into the medulla as vacuolated areas. The posterior cerebellar tract could also be traced into the medulla. Direct pyramidal tract, unilateral involvement in lumbar, bilateral in thoracic. Rarefaction of the cells of Clarke's column. Vascular changes marked.

Case 4. Patient æt. 41. Syphilis denied. Alcohol to excess. Onset with pains and weakness. Gait spastic ataxic at first. Reflexes increased.

Babinski positive. Marked sensory disturbance. Microscopical: Sclerotic foci in posterior columns of lumbar region, which occupy in the thoracic region the entire posterior area. In cervical segments, systematic degeneration of the Goll's tract and new foci of sclerosis in Burdach's. Marginal degeneration and thickening of the glia around periphery in the lumbar region. Crossed pyramidal tracts degenerated in lumbar segments. Degeneration in thoracic area spreads further than the limits of the pyramidal tract. The posterior cerebellar tracts in their entire extent are degenerated, in the lower portions as sclerotic foci, in the upper portion as vacuolated areas.

Case 5. Patient æt. 50. Mother died of nervous malady; himself always healthy. No venereal or alcoholic history. Onset with gastrointestinal trouble, then paresthesias. Spasms and intention tremor in upper extremity, spastic-paretic lower extremities, increased tendon reflexes. Sensory disturbances. The spastic condition changed finally to a flaccid state. Microscopical: Sclerotic foci in the posterior columns of the lumbar segments. Pure sclerosis of Goll's tracts in the thoracic and cervical segments. Focal areas of sclerosis in Burdach's tracts of the thoracic and lower cervical. The lateral pyramidal tracts showed beginning changes in the lumbar, increasing changes in thoracic, and less marked changes in the upper cervical. Posterior cerebellar tracts degenerated throughout, appearing as vacuolated areas. Irregular degeneration of the direct pyramidal tracts. Vascular changes marked. Anterior and posterior horn cells normal. Cells of Clarke's columns atrophied. Duration of illness one and one fourth years. Nervous symptoms present for eight months.

Case 6. Patient æt. 47. No hereditary tendency. Two years before onset of present illness he had severe anemia, paresthesias, disturbances of sensation, and lost patellar tendon reflexes. Complete recovery. Severe disturbances again set in, this time without anemia, beginning with flaccid paralysis, and ataxia in the lower extremities, without sensory disturbances. Later spastic-paretic; loss of control of bladder and rectum, and sensory disturbances. Microscopically: Posterior columns, sclerotic foci in the lumbar region, complete degeneration in the lower thoracic segments. In the upper thoracic and cervical segments, symmetrical degeneration of Goll's tracts, and partly of Burdach's. In addition isolated foci. Lateral pyramidal tracts: Sclerosis from upper lumbar to the cervical segments, gradually diminishing in intensity in the cervical. Anterior pyramidal: From the upper lumbar diffuse partly focal sclerotic areas, gradually diminishing in the cervical region. Anterior and posterior gray substance, normal.

6. *Torticollis*.—The author contributes the clinical report of three new cases of torticollis, and the pathological report in one old case, previously described clinically in this journal, 1905, vol. 29. The psychical nature of this disease, Pitres to the contrary, seems undoubted to the writer. None of the writer's cases showed any labyrinthine symptoms. The pathological findings showed degeneration of the columns of Goll and Burdach, meningeal and ventricular hemorrhage. The association of these changes with torticollis is difficult to understand. In the second case the psychic insult preceded the onset of the torticollis by a week. No hysterical stigmata were found. The jerkings extended further than the innervation of the accessorius, and was on both sides. Therapy enabled the patient to return to work. In the third case the spasms would cease if a light cloth were bound around the head.

7. *Peripheral Nerve Fibers*.—The author demonstrates the fibrils in the normal medullated nerve, with a special stain. He thinks it has the advantage over Kupfer's and Bethe's method in the regularity of the results and the more intense staining of the fibrils and sheaths. His studies were made on the nerves of the frog and mouse, and showed that the sheath of Schwann is continuous over the Ranvier construction, forming here a thick ring. The fibrils seem to anastomose, and are not isolated either in the inter-annular segment or in the constriction area. The technique is as follows:

1. Fixation in a 25 per cent. solution of osmic acid in normal salt solution.

2. Imbed in paraffin.

3. Stain with hematoxylin solution five minutes to one hour.

4. Wash out with water.

5. Alcohol, Canada balsam, etc.

Staining solution:

(a) Hematoxylin 1.0 (Grubler's).

Absoute alcohol 10.0.

(b) Aqueous alum solution, 10 per cent.

(c) Aqueous potassium permanganate solution, 1 per cent.

Mix 5 c.cm. of (a) with 100 c.cm. of (b). Add just sufficient (c) without causing precipitation. Shake well, and when the color is dark violet it is ready for use. Fewer mistakes occur if the (a + b) solution is left several weeks in open flask and frequently shaken, until it is dark red. Then only add one drop of the potassium permanganate solution to 2 or 3 c.cm. of the (a + b) solution. The staining produces a dark violet sheath of Schwann and Henle and their nuclei and fibrils, while the interfibrillar substance is either colorless or light blue. Overstaining is counteracted by a weak hydrochloric acid solution.

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Revue de Psychiatrie et de Psychologie Experimentale

(April, 1909)

1. Organic Dependence of Hope and Effort. BRIDOU.
2. Two Cases of Subacute Mental Confusion due to Tubercular Intoxication. DAMAYE.

1. *Hope and Effort*.—A speculative psychological article. Not of special interest to psychiatry.

2. *Confusion Due to Tuberculosis*.—These cases present no special features of interest.

(May, 1909)

1. Circumscribed Lesions in General Paralysis. VIGOUROUX and NAUDASCHER.
2. Note on Fixed Ideas in Mystic Delirium. DUPRAT.

1. *Circumscribed Lesions in Paralysis*.—In the autopsies of general paretics one finds sometimes, rarely it is true, circumscribed lesions: foci of softening, hemorrhages, tumors, along with diffuse lesions. These circumscribed lesions are anterior or posterior to the clinical appearance of general paresis; some may, in certain cases, be considered as the point of departure of the diffuse inflammatory lesions, others are accidental concomitants, or simple coincidences, others finally are true complications

supervening in the course of the disease. According to the location, these circumscribed lesions may give rise to clinical symptoms, or remain silent, and be found only at autopsy.

2. *Fixed Ideas in Mystic Delirium*.—A report of a case of no particular interest.

(June, 1900)

1. *Psychic Symptoms of Second Order in General Paralysis*. JOFFROY and MIGNOT.

2. *The Insane in the Army*. ROLET.

1. *Psychic Symptoms in Paralysis*.—The authors discuss the deliria, maniacal and melancholic states, expansive delirium, ideas of obstruction, ideas of persecution and of jealousy, circular forms, and hallucinations. Particular attention is called to the absurdity of the ideas held by paretics. Although theoretically the pure form of general paralysis is without delirium still practically this is not so because of the severely tainted neuropathic soil, the bad heredity of paretics. Among the depressed cases there is often no consistency of reaction. The patient without a stomach eats regularly. The ideas of persecution, when they occur, are only loosely organized into a system. The evidence as to hallucinations varies greatly, the authors believe, because of the different classes of patients observed. There is, they say, a morbid hierarchy as there is a social hierarchy. Hallucinations appear in the upper classes of this hierarchy while the epileptogenic tendency appears in the lower strata.

2. *Insane in the Army*.—This article is a plea for the recognition of the importance of psychiatric problems in the army and the necessity of instruction in psychiatry in the army medical schools. Brief reference is made to the precautions against enlisting badly tainted recruits taken by Prussia, Switzerland, and Belgium.

WHITE.

Archiv für Psychiatrie und Nervenkrankheiten

(Band 45, Heft 2)

XIV. *Contributions to the Pathology of Neural Muscular Atrophy*. GIERLICH.

XV. *Disturbances of the Attention in Hysteria*. DÖBLIN.

XVI. *Acute Cerebellar Ataxia*. ERNST SCHULTZE.

XVII. *Contribution to the Pathological Anatomy of Catatonia*. RENKICHI MORIYASU.

XVIII. *Disease of the Spinal Cord and Psychoses in Pernicious Anemia*. E. SIEMERLING.

XIX. *Multiple Papilloma (Adenocarcinoma) of the Brain*. O. KÖLPIN.

XX. *Microgyria and Absence of the Corpus Callosum in the Human Brain*. DANIEL GROZ.

XXI. *The Bezold-Edelmann Continuous Tone Scale as a Method of Examination for the Neurologist*. KÜHNE.

XXII. *Contribution to the Pathological Anatomy and the Pathogenesis of a Case of Acute Poliomyelitis in a Child with a picture of an ascending Landry's Paralysis*. THERESE SAVINI-CASTANO and EMIL SAVINI.

XXIII. *Two Cases of Hemianesthesia without Disturbances of Motility*. WILHELM FREIHERR V. STAUFFENBERG.

XXIV. Disturbances of Brain Development in Juvenile Paralysis.

ARTHUR TRAPET.

XIV. *Muscular Atrophy*.—Gierlich reports with autopsy and detailed microscopic findings the case of a boy having the neural form of muscular atrophy. The disease began at the end of the first or beginning of the second year of life and steadily progressed. In the fourth year atrophy of the small hand muscles began and death occurred under symptoms of general muscular atrophy. An older brother suffered from precisely the same disturbances and both died within eight days of broncho-pneumonia. In the case examined, microscopically there was dorsal degeneration in the cord, limiting itself in the upper part to the column of Goll. There was also slight degeneration in the lateral tracts of the lumbar and thoracic regions. Clarke's columns showed loss of fibers and degeneration of cells and a similar condition was present in the ventral horns of the lumbar enlargement. Nerve roots were not diseased. Both nerves and muscles of the lower extremities were in a state of degeneration. The oblongata, pons, cerebellum and cerebrum were normal. A discussion of the findings of other observers follows the report.

XV. *Hysteria and Attention*.—In this article Döblin analyzes a case of hysteria with "Dämmerzustanden" and other marked symptoms. The analysis concerns itself with a series of minute and unusual details of the clinical picture, leading ultimately to the conception of a peculiar disturbance of attention which is described as "Dysergasie." Dysergasie is defined as a failure of energy with a distribution of the attention in an irregular ataxic manner which naturally does not represent a disease and, in fact, hardly a symptom, but rather a mental attitude in a certain abnormal state.

XVI. *Cerebellar Ataxia*.—Schultze describes two cases under this head, one occurring in a case of progressive paralysis with so unusual a disturbance of coördination that it may with justice be called a cerebellar ataxia. It is admitted, however, that this case strictly speaking possibly ought not to be placed in this category. The second case reported showed a variety of symptoms referable to the cranial nerves and the nerves of the extremities. Particularly important is the discussion of the internal ear disease which occurred in the case. The entire situation is finally explained through a neuritis involving not only the nerves of the extremities, but probably also the cochlear and vestibular nerves as well. The ataxia itself is, however, regarded as most probably due to an encephalitis of the cerebellum.

XVII. *Catatonia*.—Moriyasu concludes an elaborate study of the pathological anatomy of catatonia with the following observations: (1) In catatonia, fibrils in every region of the cerebral cortex are degenerated in small areas and are decidedly reduced in number. It cannot, however, be said that any one place is regularly most seriously affected. (2) The changes of the ganglion cells are not characteristic, since they occur also in other psychoses. (3) Changes of the blood vessels are without significance. They are often increased and thickened and their walls show much pigment. Mast cells are found in the vessel walls. (4) Glia nuclei appear to be much increased about the vessels. Trabant cells are distinctly increased about the pyramidal cells. A striking change in the ganglion cells of Clarke's columns was constant in the cases studied. There were also more or less definite alterations in the anterior horn cells.

XVIII. *Pernicious Anemia*.—In this article Siemerling returns to the interesting question of the changes in the spinal cord and the psychoses occurring in pernicious anemia. After a brief reference to the well-known work of Nonne, Lichtheim, Minnich and others, a single case is reported in utmost detail in which syphilis and alcoholism played a part in the etiology. The pathological findings in the case, constituting a quasi-systemic disease, were those frequently described. The patient showed distinct mental peculiarities which for the most part were to be explained on the basis of his alcoholic habits. It is, however, pointed out that apart from such an etiology the mental disturbance associated with pernicious anemia is similar to that observed in infectious diseases and in intoxications. Siemerling is inclined to find the etiological factor, both of the anemia and of the spinal and cerebral disturbances, in a toxic material or bacterial poison which works its effect simultaneously upon the blood and upon the nervous tissue.

XIX. *Papilloma*.—Kölpin offers in this brief communication a clinical history and pathological findings in a case of multiple papilloma (adenocarcinoma) of the brain. The interesting question of the origin of the tumor could not be answered, since an investigation of the body was not possible. The opinion is expressed, however, that the possibility of a primary epithelial new growth of the brain cannot be excluded.

XX. *Microgyria and Absent Corpus Callosum*.—Two cases of microgyria and absence of the corpus callosum in the human brain are described in this article. The communication is valuable as a report of cases rather than as an elucidation of the problem of causation.

XXI. *Tone Scale in Neurology*.—Kühne offers a technical discussion of the significance in diagnosis of the Bezold-Edelmann continuous series of tones. Among other conclusions which are of too technical a nature to permit of a detailed abstract, it is stated that in the pure traumatic neuroses a characteristic result may be obtained by the Bezold-Edelmann method. In such cases both bone and air conduction may be shortened in time and increasingly the longer the examination lasts. The extent of the shortening is dependent upon the existing psychical state and is, therefore, not constant from day to day. The phenomenon is regarded as a result of fatigue.

XXII. *Polio-myelitis Acuta*.—On the basis of a single case of polio-myelitis in a child which had the peculiarity simply of developing as an ascending paralysis the writers discuss at considerable length the theories of the disease and the statements of others regarding it. The paper adds little to our knowledge, but is useful as a carefully reported case with adequate microscopic examination. This ascending type in the form of a so-called Landry's paralysis is no longer to be regarded as a rarity.

XXIII. *Hemianesthesia*.—Two cases of the somewhat unusual condition of hemianesthesia without disturbances of motility are described by v. Stauffenberg. In the first case which occurred in a patient with a high degree of cerebral arterio-sclerosis there were multiple lesions in the brain, which, however, were largely in the distribution of the artery of the fossa of Sylvius and of the posterior cerebral artery. The hemianesthesia is regarded as due to destruction of the under part of the post-central and supramarginal gyri. Other conditions of interest in the visual and speech spheres are explained by various other lesions. The second case is of less value since no autopsy was done. In general, the conclusion is reached that such cases of severe persistent hemianesthesia

without disturbance of motion are calculated to lend weight to the view that the sensory and motor tracts are separated in their course.

XXIV. *Juvenile Paresis*.—A case of juvenile general paralysis is described by Trapet with special reference to the problem of developmental disturbance in the brain. Attention is called to the frequent occurrence of progressive paralysis in children who from the outset are mentally deficient. In the case under discussion the microscopic examination showed degenerations characteristic of paresis, extending over the entire brain with unusual evidences of infiltration. In this latter fact the author is inclined to see a difference between the paresis of adults and children. In general many anomalies were found in the brain indicative of a general checking of its development. As a cause of this developmental disturbance hereditary syphilis, which in general affords an important etiological factor in developmental anomalies of the central nervous system is regarded as most probable. This disturbance in the development of the brain is to be considered as providing a favorable ground for the later development of general paralysis.

TAYLOR (Boston).

Psychiatrisch-Neurologische Wochenschrift

(June 27, July 4, July 11, 1908)

1. Commitment for Chronic Alcoholism. WALDSCHMIDT. (*Continued*.)
2. The Question of Abstinence Delirium. HOLITSCHER. (*Continued*.)

(July 18, 1908)

3. The Bodily Accompaniments of Dementia. LOMER.
4. The Question of Abstinence Delirium. (*Continued*.)

1. *Commitment for Alcoholism*.—An article which deals with conditions in Germany. Not suitable for abstracting.

3. *Accompaniments of Dementia*.—So long as we have no means of accurately testing the intelligence it becomes of importance to gather all possible collateral evidence bearing on the seriousness of the mental affliction. The physical signs, vasomotor, secretory, and nutritional, are important. Attention is particularly called to vasomotor paresis with cyanosis of the extremities, increased secretion of saliva, and increase in fat as especially ominous physical signs in the insane. Other important signs are seborrhea, hyperidrosis of hands and feet, scaly skin, and pallor.

4. *Abstinence Delirium*.—The author instituted an investigation into the occurrences of abstinence delirium by means of the questionnaire method. He received all sorts of opinions founded on large experiences in special and general hospitals. He concludes that abstinence delirium if it occurs at all is very rare. Care must be taken in reaching a conclusion to eliminate as possible causes, wounds, infectious diseases, psychic shocks, operations, etc. We must remember also that in many cases the delirium has had a prodromal period of a number of days and that one of the symptoms of this period is disgust for liquor. The delirium, therefore, occurs in spite of, not because of abstinence.

(October 17, 1908)

1. The Symptomatology of Epilepsy. BRESLER.

1. *Symptomatology of Epilepsy*.—The psychic changes preceding an epileptic attack usually give states of anxiety, fear, anger and the like; a state of euphoria with talkativeness, activity, feeling of joy, lightness and well-being is rare. The author records two such cases. Kraepelin and Heilbronner have observed similar cases.

Ordinarily temporal orientation is more easily disturbed than spatial. The author reports an epileptic with psychic equivalents, who was entirely disoriented spatially, thought he was in an entirely different place, a different house, but knew the year, date, and day of the week and in fact came within three quarters of an hour to the time of day. One other epileptic with similar relation between temporal and spatial orientation was observed in a post-paroxysmal dream state. The author has seen two similar cases in climacteric depressive psychoses.

1. Analytic Significance and Treatment of Psychosexual Impotence in Men. FERENCZI.

1. *Impotence in Men*.—From the analysis and study of several cases, according to the methods of Freud the author comes to the following conclusions: (1) The psychosexual impotence of men is always a part of a psychoneurosis and answers to Freud's conception of the genesis of psychoneurotic symptoms. It is also always the symbolic manifestation from suppressed memories of infantile sexual events from the subconscious, from the repetition of resisted wishes and the resulting mental conflict. These memory traces and wish agitations in sexual impotence are always of such a kind or relate to such personalities, that they are incompatible with the conscious thoughts of the grown up cultured man. The sexual inhibition is thus a prohibition of the subconscious, that addresses itself against a particular kind of sexual activity; for better security, however, the suppression is extended to sexual satisfaction in general. (2) The sexual events of early childhood which determine the later inhibition may be serious psychic traumas. If, however, the disposition to neuroses is great, unavoidable and apparently harmless impressions may lead to the same results. (3) Among the causes of the later psychosexual impotence the incestuous fixation (Freud) and the sexual shame in childhood have a specially great significance. (4) The inhibitory effect of the suppressed complex may even at the first effort at cohabitation assert itself and become fixed. In light cases the inhibition comes later, as the result of specially strong sexual excitation or cohabitation associated with apprehension. This sufficiently deeply pursued analysis may, however, in all similar cases besides, exactly behind the actual depression producing noxa also be able to demonstrate suppressed infantile memories associated with subconscious phantasies. (5) The full understanding of a case of psychosexual impotence is only conceivable with the help of Freud's psychoanalysis. By means of this method it is possible to bring about even in difficult, apparently chronic cases, a cure and prevention of the return of symptoms. In light cases suggestion or a superficial analysis may lead to the same end. (6) The psychoneurosis, of which the sexual inhibition is a part, is mostly complicated by symptoms of an actual neurosis in the sense of Freund (neurasthenia, anxiety neurosis).

WHITE.

Zentralblatt für Nervenheilkunde und Psychiatrie

(April 1 and 15, 1909)

1. A Case of General Paralysis with Brain Tumor. RÜHLE.
2. Responsibility and Disease. BLEULER.
3. A Contribution to the Study of the Disturbance of Association. WERN H. BECKER.

1. *Paresis and Brain Tumor*.—Rühle reviews briefly the literature of brain tumors in general paralysis and finds that such a peculiar combination is extremely rare. He reports a case of general paralysis in which a neoplasm of the frontal region was discovered at autopsy. The case ran the usual course and *intra vitam* tumor was not suspected. In fact there were no focal symptoms indicating such a process—although the eye grounds were not examined. Both macroscopic and microscopic examination revealed the anatomic alterations peculiar to paresis. It is interesting to note that the pia in the neighborhood of the tumor was free from typical infiltration cells; the connective tissue septa in the tumor showed except numerous mast cells no other important elements; the few vessels in the tumor were not infiltrated. The tumor was a spindle cell sarcoma.

2. *Responsibility*.—Bleuler maintains that mental responsibility in border line cases of psychoses of endogenic type is purely *relative* and we ought to be guided by the exact circumstances in each individual case. For instance, patients with low grade of imbecility are able to discriminate between right and wrong only with simple things but in presence of complicated relations their ethical sense is unbalanced.

3. *Association Disturbances*.—The author offers the following conclusions: Among the associations which arise in an idea the sound associations are the most significant, being the most noticeable to the observer. While many another association, especially in the insane, defies our attempts of explanation; sound associations are most frequently manifested, and form, especially when judgments are based upon them, a real ground-work for the further development of psychiatric symptomatology. A judgment association which would not stand a test of logic, but which is firmly fixed, in an insane patient, as a result of years' inability of rectification or readjustment, speaks in behalf of a paranoid psychosis or at least of one of paranoid character.

M. J. KARPAS (Zürich, Switzerland).

Book Reviews

DIE FUNKTIONEN DER NERVENCENTRA. Von Prof. Dr. W. v. Bechterew. O. Akademiker; Direktor der Psychiatrischen und Nervenlinik der Medizinischen Akademie; Präsident des psychoneurologischen Institutes in St. Petersburg. Deutsche Ausgabe in Verbindung mit dem Verfasser redigiert durch Dr. Richard Weinberg, Professor der Anatomie in St. Petersburg. Erstes Heft. Gustav Fischer, Jena.

The extraordinary mental activity of von Bechterew is well known; the latest example being this first volume of nearly 700 pages, which is one of four projected on the functions of the nervous centers. It includes a short introduction, a discussion of the methods of investigation, in which he has been a pioneer, the spinal cord and the medulla.

He purposes to deal with the cerebellum, the midbrain, the interbrain and the forebrain in the subsequent volumes, the second of which has already appeared.

In the general portion dealing with methods of investigation the more important of the helps that have contributed to our present day knowledge of the anatomy of the nervous system and its functions are thoroughly discussed. He then deals directly with the functions of the spinal cord and medulla first outlining the modern anatomical conceptions underlying these physiological functions.

Practically everything is minutely gone into, making the work an encyclopedia of the physiology of the spinal and medullary activities. It is all exposed with great clearness, the works of others are copiously utilized, but the author's own original investigations are freely drawn upon.

It is impossible to present even in the barest outline what this work contains. We venture to accord it the merit of being the best reference work on the nervous mechanisms of the cord and medulla in existence at the present time. We know of nothing with which to compare it in its breadth of scope and wealth of detail.

JELLIFFE.

PSYCHOLOGIE DES VERBRECHERS, Ein Handbuch für Juristen, Aerzte, Pädagogen, und Gebildete aller Stände. Von Dr. Eric Wulffen. Staatsanwalt in Dresden. 2 vols. P. Langenscheidt. Gross-Lichterfelde. Berlin, G. E. Stechert, New York. Bound \$7.50.

This is a two-volume work of over 400 pages, each dealing with the mental character that makes up criminality. In the first volume, the initial chapter deals with general physiology and psychology, Chapter II, is on Psychiatry; Chapter III, Anthropology; Chapter IV, Statistics; Chapter V, Ethics; Chapter VI, Characterology; VII, Psychology of Crime and Criminal Specialities; Chapter VIII, Psychology of Punishment, and Results of Punishment.

No idea of the ambitious program of the book can be gained from

these very short chapter headings. The varied colorings, and extreme multiplicity of types of social parasites make the general science of criminology a difficult one even to formulate, and much more to satisfactorily encompass in book form. The legal machinery which has grown up about it tends to confuse the interests, and so far as the United States is concerned contributes its parasites to the others.

The author's chapters on the general physiology and psychology of the nervous system are formulated closely on Wundt's physiological psychological teachings, in which case they can not go far wrong as guides. His psychiatry is a review of that of Krafft-Ebing, which is to be regretted in view of its age. Sommer, Cramer, Gross, and Aschaffenburg are the others followed but his general point of view is that of the older Viennese School, fortunately rendered less rigid by the work of the newer studies noted.

Wulffen's anthropology is Lombrosian, and although the work of more modern students is freely quoted, he does not free himself from the fast lines of the Italian School. He sees categories, not biological variations. He sorts types as though they were entities, and thus gives us an inelastic series of formulae that are perhaps desirable from the legal standpoint, but are bad science on biological grounds.

His ethics is that of Wundt's.

His characterology is very old, not going back it is true to the rich character studies of the Arabians of the twelfth century, but nevertheless hardly the modern teaching of Kraepelin and his school. Whether characterology is anything more than highly complex and fluctuating concept, or is capable of rigid formulation, is a much contested question. Lay students are opposed to psychiatrists in this regard, and throughout popular literature the belief in "temperaments" and similar simple generalization is widespread. The author does not adopt the lay standpoint, but has made his system fairly rigid.

Chapter VII, on Specialism in Crime, is extremely interesting and practical. The chapter on punishment is also good.

The encyclopedic character of the work renders individualization in comment difficult. Further the style is that of a compilation rather than original, but it is a wonderful setting forth of the general problems of criminology and will be of immense service. The publisher has done a splendid piece of work.

It is a great reproach to criminology in this country to find excellent works of this kind in the German language, but practically nothing of any value with us. We have romances, stories, and idle vaporings, but serious studies—none.

JELLIFFE.

DIE WILLENSFREIHEIT IN MODERNER, THEOLOGISCHER, PSYCHIATRISCHER UND JURISTISCHER BELEUCHTUNG. Dr. Joh. Bresler, Carl Marhold, Halle a. S., 80 pf.

This small contribution to the much discussed problem of freedom of the will takes up the modern psychiatric viewpoint and discusses it in relation to responsibility in the legal sense. It is keen and clear, but concerns code specifications that are applicable to the German laws rather than our own. Nevertheless, the principles laid down hold good universally and with such application the brochure can be read with pleasure and profit.

JELLIFFE.

PUPILLENLEHRE, ANATOMIE, PHYSIOLOGIE UND PATHOLOGIE, METHODIK DER UNTERSUCHUNG. Von Dr. Ludwig Bach. S. Karger, Berlin.

The author, at present adjunct professor of ophthalmology in Marburg, began these studies on the pupil while working in the psychiatric clinic of Würzburg, under Director Rieger.

Feeling the need of a systematic presentation of the pupillary phenomena, which are only touched upon in text books or scattered in various places in technical treatises, he has sought to bring them together. In so doing Bach has given neurologists and psychiatrists an extremely useful manual.

The anatomy and physiology of the pupillary phenomena are first discussed, after which there is a chapter in the general pathology of the pupil, considering the variations in form and the pathology of the reflex mechanisms. A further chapter discusses the special pathology, stress being laid particularly on pupillary changes in neurologic and psychiatric disorders. A final chapter on methods of examination and a bibliography of 1,800 titles concludes the volume.

It is the best thing of its kind and will prove indispensable.

JELLIFFE.

JURISTISCH-PSYCHIATRISCHE GRENZFRAGEN. Vol. 6, Heft 2, 3, 4, 5, 6, 7, 8. Carl Marhold, Halle a. S.

These numbers of this interesting series on borderland problems of law and psychiatry concern themselves with the subject of the forensic significance of alcoholism, on relation of the mental inventory to responsibility and working liability and the care of the dangerously mentally ill, the querulant and his restraint. They are for the most part papers given before the society of legal psychology and psychiatry of Hessen.

This series is full of profitable small papers and the present volume is no exception. They are in strong contrast to much medico-legal mush that is inflicted upon the public here.

JELLIFFE.

DER UNFALL IN DER AETIOLOGIE DER NERVENKRANKHEITEN. Von Dr. Kurt Mendel, Berlin. S. Karger, Berlin.

In this short monograph dedicated to his father, Dr. Mendel gives the results of an analysis of some 1,500 "Gutachten" which were available from his father's library, from those of friends and from his own practice. They constitute a notable contribution to the difficult question of the etiological relation of trauma to nervous disease.

He discusses the following diseases from this standpoint: General paresis, brain tumor, brain abscess, delayed apoplexy, late meningitis, tabes, multiple sclerosis, syringomyelia, myelitis, amyotrophic lateral sclerosis, progressive muscular atrophy, dystrophia muscularis progressiva, neuritis, paralysis agitans, Basedow's disease, acromegaly, and epilepsy.

The author's general conclusions must be read in the original. They are sound and logical. He lays particular stress upon the factor of predisposition. Many after-coming disorders must seek an explanation in some unknown constitutional defects which are brought out by the trauma. Tabes and general paresis are held to be post-syphilitic affections, the trauma may be conceived to be the point of departure along the downward path. In other nervous and mental disorders trauma must

be recognized as one of many etiological factors, and in some it is highly probable that it has no relationship whatever.

To the student of accident litigation this work will prove of special interest; to the general neurologist it will be a stimulus to extended observation in order that many of the problems of cause and effect may be furthered in their solution.

JELLIFFE.

DREI AUFSÄTZE AUS DEM APRAXIE GEBIET. Von Prof. Dr. phil. et. med. H. Liepmann, Oberarzt an der Städt. Irrenanstalt Dalldorf in Berlin. S. Karger, Berlin.

The condition now known as apraxia, namely, that inability of an individual who has neither motor nor sensory paralysis, nor ataxia, to perform certain familiar purposive movements, as Wilson in a recent masterly summary of the subject of apraxia has well remarked is no new discovery. But of all of the workers in this field none have done such painstaking systematic work as Liepmann, and these contributions are important land marks in the progress of the work on apraxia.

They are reprints of three articles; (a) On Small Helps in the Study of Brain Disorders; (b) On the Left Hemisphere and Conduct; and (c) The Functions of the Corpus Callosum in Behavior and the Relations of Aphasia and Apraxia to Intelligence, which have appeared in German periodicals in 1905 and 1907, respectively.

Of these papers the last is of special interest, since he shows along what lines progress is likely to take place in the study of the intellectual functions, and offers many useful suggestions to psychiatrists in the analysis of dementia. It is a privilege to have these papers preserved in this collected form.

JELLIFFE.

NEURASTHENIA. Gilbert Ballet, Professor of the Faculty of Medicine, Paris. Director of the Psychiatric Clinic, St. Anne, Paris. Translated from the third French Edition by P. Campbell Smith, M.D. Paul B. Hoeber, New York. \$2.00

Ballet's work on neurasthenia is one of the best things he has done, and in its English dress will make a very welcome addition to the neurologist's work shop. While lacking the profound and objective character of much German work on the same subject, notably Binswanger's very careful piece of work, Ballet's treatise has the charm of a French classic. Its practical suggestions are rich and varied and all in all it is a work worth reading, not so much for the purpose of gaining new ideas or extending the confines of research, but for its clear and simple presentation combined with a certain elegance of which the French are such masters.

JELLIFFE.

FUNCTIONAL NERVOUS DISEASES. A. T. Schofield, M.D., Hon. Phys. Freidenheim Hospital. E. P. Dutton and Company, New York. \$2.50.

"The difference between veterinary art and medicine is only that of the clientele, once the mind is left out" is a phrase that strikes the reviewer's eye in the introduction to this very interestingly written work. This is all too true, for the study of disturbed mental functioning is entirely neglected by the average practitioner.

The author's psychology is woefully antique. It is still a slough of metaphysical speculation. He apparently knows nothing of the definite knowledge of tract associations, cerebral localization, and perverted mental activities interpreted on the basis of definite lesions. We have general schemes reproduced *ad infinitum*. He tells us the neurones are all different, the way finger tips are different, but nothing ever gets beyond the haze of the subconscious and similar misty conceptions.

Schofield adopts Janet's definition of hysteria. He gives a very discursive discussion, as is also the case with neurasthenia. We note that chorea, tetany and epilepsy are put down as functional disorders.

Apart from individual beliefs, that the term functional has hypothetically no real excuse and practically leads to much confusion, the present author's handling of the whole subject is disappointing. He is nebulous, inexact, and wholly unacquainted with the subject matter of his book, save seen from the standpoint of a harmless raconteur. This of course does not absolutely preclude its usefulness.

JELLIFFE.

The Journal OF Nervous and Mental Disease

Original Articles

A CASE OF PURE WORD-DEAFNESS WITH AUTOPSY¹

BY ALBERT M. BARRETT, M.D.

(From the State Psychopathic Hospital, Ann Arbor, Mich.)

The following study is of a case which presented clinically a nearly classical example of that disturbance of speech which, from the descriptions of Lichtheim and Liepmann has been called subcortical auditory aphasia or pure word-deafness. It was possible in this instance to obtain a thorough examination of the subject's speech capacity and later to study the brain by the method of serial sections. For the clinical notes I am indebted to the physicians of the Danvers Hospital.

The subject was a man named Taft, possessed of ordinary mental capacity, evidently sufficient for the conduct of a successful lumber business. He was right-handed, and until he was about 45 he had enjoyed good health. At that time, while walking on the street, he suddenly lost the use of his legs, and for a period following he was unable to walk. He later on was able to get about quite well, but there persisted a certain amount of ataxia in his leg movements. He continued at his business until he was 52 when he gave up work. For some years previous there had been developing an increasing crankiness in his disposition and he showed a number of eccentricities of conduct, such as doing little things to annoy his family—as shouting, whistling and slamming doors. In more recent years these peculiarities became more pronounced. There is a general agreement among his friends that up to within ten days of his admission to the hospital, he retained most of his mental capacity. His memory was

¹Read at the thirty-fifth annual meeting of the American Neurological Association, May 27, 28 and 29, 1909.

impaired, but if humored in his whims he was agreeable and well informed regarding current events.

When he was 67 he had what was described as "some sort of a turn in which he became decidedly worse." A few days later he experienced another attack in which he lost the power of speech. Whether or not he was unconscious in either of these attacks is not known. What he spoke could not be understood, wrong words were used in his sentences and he could not understand what was said to him.

For many years previous to these attacks he was regarded as having been totally deaf in his right ear. He and his daughter declared that this followed the explosion of a gun. Hearing in his left ear was not impaired until the present attacks. While during the previous year a slight slurring of speech had been noticed, no such disturbance as that which now occurred had been present. He had always spoken so that he could be readily understood. Ten days following these attacks he came into the Danvers Insane Hospital.

The physical examination made at his admission demonstrated a certain increase in the size of the heart, accentuated second aortic sound and irregular rhythm.

The neurological abnormalities were: inability to stand or walk; marked ataxia in his leg movements; upper extremities quite well controlled; the pupils were small and unequal, the left being larger than the right; although the reactions were difficult to test they seemed to react slightly to direct light stimuli; the knee-jerks were absent; tests for sensibility so far as could be determined did not show any abnormalities, except that he complained much of sharp pains in his legs.

The disturbances of his speech had at all times since his admission been most striking. He was wholly unable to understand anything spoken to him. Communication was only possible through gestures and writing. A systematic examination of his speech capacity was not made until some time later, but the notes made from time to time gave much information regarding the aphasic disturbances. At his admission he had some difficulty in reading the written questions, but with continued efforts he understood them in about one-half the tests.

While he never comprehended spoken words, he reacted quickly to sounds. He knew where he was, but instead of the name Danvers, he said "Dabbers, Dibbers," and finally "Danvers." That he knew the location of the hospital is evidenced in his reply, "Yes, that is it right here up on the hill."

He appreciated his inability to understand what was said to him and his difficulty in expressing his own thoughts. He easily became exasperated at his failure to speak as he wished. His first attempts in spontaneous speech were usually more or less jargon, but repeated efforts showed a progressing improve-

ment and eventually he expressed himself quite intelligibly. With some difficulty in expression he gave the date correctly, recalled that he came to the hospital on the day before, and in telling of his experiences in coming, said, "No, they bribed me here without consulting me."

When shown the written question, "How long have you been here?" he replied, "Well, I have been troubled a good many years; had this ten weeks; had trouble with my debts, don't wear here." His home had formerly been in the vicinity of Danvers, and in speaking of his son-in-law, said, "Don't you know the Harry Debber, down to Dibber, his wife is my son." He spoke of his daughter as "Katheribed, Caribed." He became exasperated at his failures, which he recognized keenly, and said, "I am kinder blue eyed, mixed kind of wide." To the question asking him if he knew the building he was in, he replied, "Yes, it is Purrington, I don't know just how to pass it out just now. I could think of it yesterday. It just comes for a moment and then bids back just the name."

During the next two months the notes record that he showed no marked change. "The aphasic condition persists, and he is at all times irritable and fault-finding." He sat in an invalid chair, unable to walk and he complained much of pains in his legs.

February 1, 1902. Some edema of the legs. Word-deafness complete. In referring to his ear, said, "I wish some one would sear this ear out. I want it combed onced. There is a little waxing in the egg."

March 13, 1902. Considerable improvement in his ability to speak more correctly. He hears sounds but cannot understand any word spoken.

April 15, 1902. Further improvement in spontaneous speech. He talks quite clearly, and with very few mistakes. He is totally unable to understand any spoken words, but he reads accurately with perfect understanding.

July 31, 1902. He speaks with very few mistakes. He writes legibly, but continues totally word-deaf.

April 2, 1903. Severe pains in his legs. Marked delay in reaction to pin pricks in legs. His spontaneous speech is more correct than at any previous time. He wrote a brief note quite coherently.

November 6, 1903. SPEECH EXAMINATION.

On this date a detailed and systematic examination of his speech capacity was made. A careful examination of his peripheral hearing capacity was kindly made by Dr. de Wales.

Left Ear.—Drum membrane generally thickened. Short process prominent. Posterior fold prominent. No light reflex. Sound reactions were as follows: Single and double vibrations of tuning fork c'' (512) and c''' (1024) were plainly heard. Rinne 14/6. With Weber test he gives no response, in one test he said

that he heard it in his head but did not seem to localize it. Politzer's acumeter test gives air conduction at one inch and bone conduction at one inch.

Right Ear.—Drum less generally thickened than the left, but has islands of thickening around the periphery. Tests with tuning forks vibrating between c'' (512) and c''' (1024) and the Galton whistle showed total absence of tone hearing. Rinne's test o/o. Laryngoscopic examination of the vocal cords showed movements in phonation to be unimpaired. The mucosa was a little reddened.

Dr. de Wales's opinion was that there was a chronic catarrhal condition of the left ear with very good hearing of the higher tones but none for the lower tones. The right ear was completely tone-deaf by reason of labyrinth disturbance.

The determination of whether the inability to understand spoken words is the result of peripheral or central disturbance is of fundamental importance in this type of aphasia. From the investigations of Bezold it is known that if as much of the tone scale as lies between b' and g'' is preserved, a sufficient range of tone exists for the understanding of spoken words. The examination in our case shows that although the right ear is completely tone-deaf from labyrinth disease, there is preserved in the left ear a tone perception continuous from c'' to the Galton whistle. For some reason there is no statement in the record of tone perceptions below c'' (512). Although the lowest tone necessary for understanding of auditory speech is given by Bezold as b' (480), this is but one tone lower than c'' , and as it was remarked in the notes of the examination that c'' was plainly heard, there seems to be evidence that there was preservation of the required tone range in the left ear, and that the condition was central rather than peripheral.

Reaction to Words and Sounds Heard.—Although totally unable to understand a single word spoken to him, he reacted to sounds. In the ordinary intercourse with him on the ward, his usual reply, when one spoke to him, was, "I don't know what you say. I can't tell." He always gave good attention and his attitude was one of perplexity at his inability to grasp what was said. In the examinations the questions were written or printed and always were read with understanding. His attention could be gained by noises made near him. When blindfolded he quickly gave attention to the whistling of some one near and spoke of it as a noise. Similar reaction followed the ringing of a bell. The rattling of keys he called "a crackling." The imitation of the cry of a cat he spoke of as "singing." The barking of a dog was called a "noise." Several tunes were whistled near his left ear; although he gave careful attention, none awakened any certain recognition. As in all attempts to recognize spoken words, his face had a troubled, puzzled look, and often he would shake

his head at his inability to grasp the interpretation of sounds he heard. On one occasion there seemed to be a question as to whether he did not recognize the whistling of Yankee Doodle.

Spontaneous Speech.—In response to the request that he give an account of his trouble, replied, "What do you mean, my head here (pointing to his head), or here (pointing to his knees)?" It being indicated that the request related to his difficulty of hearing, he replied that he could hear all right; that thirty years ago a gun was fired close to his ear and for the past two years he had been entirely deaf. In attempting to repeat the alphabet he did so correctly as far as g, he then hesitated and again began, getting as far as v, he then was puzzled and unable to proceed, he remarked, "That is funny, by George, I can't get it." With the third attempt he gave it readily without mistake from a to z. The days of the week and the names of the months were promptly and correctly given. He regarded the requests as foolish and occasionally appeared impatient and disgusted, as when asked to count from 1 to 20, he laughed and remarked, "Well, I ain't a fool." He then counted correctly but repeated 15 twice. He counted backward from 20 to 1 correctly.

Calculation Tests.— $8 \times 4 = 32$; $9 \times 7 = 63$; $12 \times 11 = 132$; $96 \div 8 = 12$; $32 \div 4 =$ he hesitated, looked in a puzzled way at the examiner and remarked, "I don't understand what you mean." On being urged he gave the answer as 23; again gave 23 and then remarked, "I don't know what you mean, you mean divide it? Why, 32." The requests to repeat spontaneously the Lord's Prayer, or some familiar verses, caused him to laugh and reply that he could give none as he had forgotten them.

His capacity for spelling was tested by requesting him to correct words which were written misspelled. He recognized and corrected the mistakes in the words "Massachusetts" and "received." When shown various objects and requested to spell their names, he gave the following reactions:

<i>Objects.</i>	<i>Spelling.</i>
Wallet	+
Cigarette	+
Pencil	Called it "pencil" but spelled it "pncil"; then three times he spelled it "pecil," each time pronouncing it as he had spelled; in fourth attempt it was correctly pronounced and spelled.
Dipper	+
Boat	+
Tongue	Pointing to the tongue, "Why, my table, why, my touble," and spells it "t-o-u-b-l-e"; at another attempt

	he pronounces and spells the word correctly.
Handkerchief	+
Pillow	+

In all the tests the name of the object was spelled as he pronounced it.

Reaction to Things Seen.—

These tests were made by showing him either actual objects or their reproduction in pictures and requesting that he name them. There was no difference in his recognition by either method:—

<i>Objects.</i>	<i>Named.</i>
Pencil	+
Wallet	+
Keys	+
Flowers	+
Cabbage	+
Tomato	+
Beans	+
Cat	+
Celery	+
Automobile	+
Brush	+
Scissors	+
Tree	+
Basket	+
Elephant	+
Deer	+
Fish	+
Snake	+
Windmill	"Millbury, millwill, wingmill, windmill."
Butterflies	"Huckleberries, butterflies."

Portraits of Lincoln, McKinley and Pope Leo were correctly identified and named.

The mistakes made in naming the last two objects were not recognized, but after several attempts were correctly given. The dissatisfaction of the examiner, at his calling butterflies "huckleberries" seemed to puzzle him. He repeated the same replies several times and then said, "I can't give the name, it ain't clear to me." On a fifth attempt he gave the correct name.

To all questions regarding the use of objects he gave correct information.

Reaction to Things Felt (Eyes Being Closed):

Right hand—

<i>Objects.</i>	<i>Named.</i>
Button	+
Pencil	"Pencil."
Watch	"Feels like a watch."
Chair	+
Toothpick	"I don't know what it is, it feels like a stick."
Coin	+
Pocketbook	"Is that anything to eat? A purse."
Bell	+
Paper	+

Left hand—

Pencil	+
Keys	+
Watch	+
Stethoscope	Feeling it with both hands, "Well, I don't know the name of it. I don't know what it is." After looking at it with his eyes open, it was evident that it was an object unfamiliar to him.

Letters and figures traced on the skin of his forehead were not recognized.

Reaction to Words Seen:

Reading.—He read both printed and written words. The written or printed requests in all tests were readily read, either aloud or silently. In reading aloud from books and paper, he read perhaps somewhat less rapidly than one would expect, from his previous habits, and paraphasic answers occasionally were given. These always resembled the correct word in sound and were quite similar to the mistakes made in the previous tests in naming objects and in the examples of spontaneous speech given in the foregoing notes. He was a constant reader of the daily paper and on request would tell what he had been reading. All tests showed that he read with understanding.

Understanding signs read:

Y. M. C. A.	"Young Men's," the latter part of his reply was paraphasic and not understood.
Y. M. C. U.	+
I. O. O. F.	+

A. O. U. W.	His first reply was paraphasic and not understood; he then remarked, "I have forgotten what it is."
F. & A. M.	"American."
N. H.	+
R. I.	+

A series of numerals were correctly read. When a series of arithmetical problems, in which the signs of $+$, \times , $-$ and \div were used, he showed some difficulty in readily understanding what the problem meant, but on repeating the tests the correct results were usually obtained.

Writing (Spontaneous).—In response to a request that he write an account of his sickness, he produced the following:

"Nov. 6.

"Dr. M.—

"You asked for my case, nearly twenty years ago. I was taken by locomotor ataxia, I got around by a cane until the last three years, and then used a crutch. A little over two years I became deaf and my brain cloudy and was sent here in December 1901. My brain is now fairly clear. I never had a headache, since I was 14 years old with a fever. I have much pain in my feet and legs mostly at night. For the last three months my water has made me much trouble a passing much in my bed at night.

"Fred A. Taft."

Many of the characters in this letter were sprawling and the handwriting was quite characteristic of the ataxia of tabes. A few words are lacking to complete some of the sentences, and in one instance the article *a* was used in an incorrect relation, but it gives no evidence of any marked disturbance of an aphasic nature.

Writing from dictation was absolutely impossible.

Drawing.—Requested to draw a house, he started to draw a horse, then stopped, and after reading the request, laughed and made a very fair start to draw a house. A tree and a cat were drawn promptly.

Copying was done correctly.

Understanding of Music.—There is no certain evidence that he understood tunes. Any detailed tests with musical instruments or of his ability to sing were not made.

The Internal Language.—In drawing conclusions from the various tests in other fields there is no evidence that there was any serious defect in his internal language.

Apraxia.—He showed on all occasions a correct appreciation

of the proper use of a variety of objects, and used them without error excepting for the ataxia in his movements.

Understanding of Colors.—He was able to name colored yarns with but occasional errors. In a few instances, there was a slight paraphasia in his answers:

<i>Color.</i>	<i>Reaction.</i>
Red	+
Pink	+
Blue	+
Red	"Pink."
Brown	"Drab, brown."
Orange	+
Yellow	+
Purple	"Pupil."
Green	"Light green."
Black	"I don't know what color it is"; on a second attempt he calls it "brown."

SUMMARY

Reaction to Words and Sounds.—Total deafness to words spoken; but gives attention to sounds; no ability to recognize meaning of sounds heard; no ability to repeat words heard.

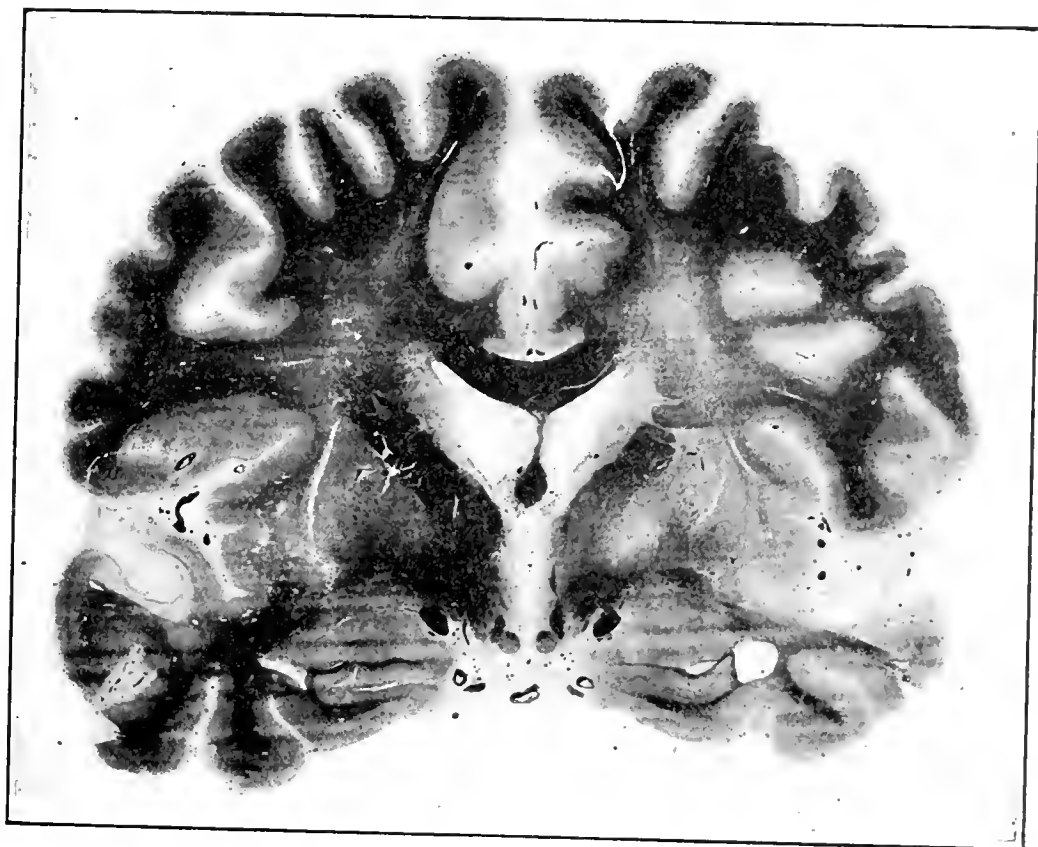


FIG. 1.

Spontaneous Speech.—Retained ability to speak spontaneously, with rare paraphasic utterances; occasional inability to speak readily the word desired, but later always giving the correct reaction; calculation fair; spelling good except for occasional paraphasia; spelling good for words pronounced.

Reaction to Things Seen.—Objects correctly recognized and named except for an occasional paraphasic reply; mistakes in pronunciation not recognized; correct color recognition.

Reaction to Things Felt.—Good for familiar objects; an occasional paraphasic reply.

Reaction to Words Seen.—Read printing and writing understandingly; unimpaired reading except for an occasional paraphasic reply; meaning of familiar signs recognized; slight difficulty in readily understanding meaning of arithmetical signs.

Writing.—Spontaneous writing and drawing ability retained; ataxia (tabetic) in writing movements; no ability to write from dictation.

Internal Language.—No evidence of impairment.

During the next six months his speech disturbance showed no change. He suffered much from cystitis and pains in his legs.



FIG. 2.

July 8, 1904. He continues totally word-deaf; he is able to read and has a good understanding of what he reads. His spontaneous speech exhibits rarely some paraphasia, a word being occasionally used in wrong relations. His memory for events from day to day is fairly good.

February 24, 1905. His physical health has failed much, but his mental condition remains much the same. He shows some difficulty in performing mathematical calculations requiring any considerable mental effort. All objects shown to him are correctly named. His written letters show grammatical correctness; his ideas are clear, but his vocabulary shows appreciable limitations. In reading aloud written directions he will rarely miscall a word, and in speaking spontaneously he sometimes makes a similar mistake.

On October 17, 1905, he fell dead suddenly, from the rupture of an aortic aneurism.

At the autopsy, held a few hours after death, the chief gross findings among the body organs were: Extensive recent hemor-



FIG. 3.

rhage into the right pleural cavity; a large aneurism of the thoracic aorta, with a recently eroded opening in its walls (the inner wall of this was covered with old and recently organized fibrin clots, and presented numerous calcareous plaques); mitral insufficiency; cardiac hypertrophy; chronic fibrous myocarditis; cirrhosis of the liver; cholelithiasis; purulent cholecystitis; chronic interstitial nephritis; purulent prostatitis; chronic cystitis.

The gross examination of the brain showed severe atheromatous degeneration of the arteries at the base of the brain. Both middle cerebral arteries showed scattered atheromatous patches.

The pia mater was transparent and delicate, excepting in the regions of both Sylvian fissures. There were residuals of old softening in both temporal lobes. In the fresh brain the regions of the right and left first temporal convolutions were sunken inward, and the pia intimately adherent to the softened areas. The limits and more exact localizing of these softenings was worked out from serial sections and will be described in another place.

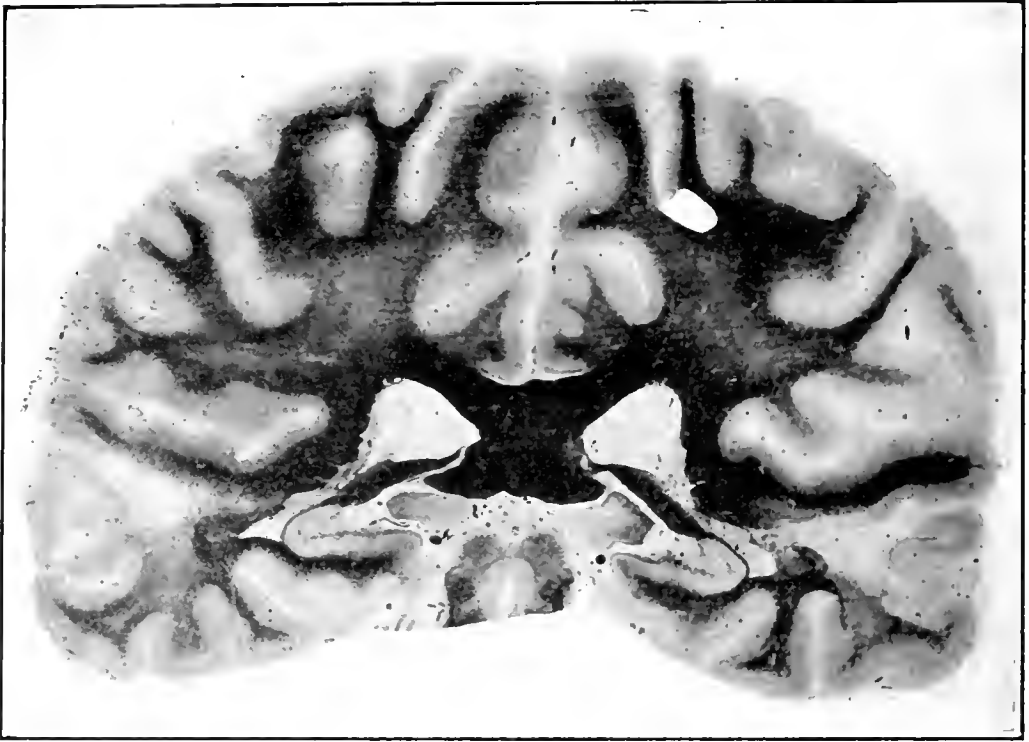


FIG. 4.

The brain was at once put into 10 per cent. formaline solution and after six weeks was divided by frontal cuts into a number of blocks, which later were cut into serial sections varying from 75 to 100 micra in thickness and stained by the Weigert-Pal method. These sections formed the basis for the descriptions following. The cranial nerves showed no gross abnormalities. The spinal cord presented a gray streak along the dorsal columns in the lower dorsal and lumbar regions. Subsequent histological study of the cord showed a characteristic tabetic posterior column degeneration.

The study of the serial sections demonstrated that only an incomplete idea of the extent of the lesions and their exact location was possible in the uncut brain. While both right and left temporal lobes were involved, it was found that on the left side the lesion was peculiarly limited to certain portions of the temporal convolutions, the relations of which were determined by subsequent reconstruction of the lesion in its entirety from the serial sections.

The relations of the lesions are well demonstrated in the photographs of the sections pictured in Figures 1-4. Fig. 1 is of a section passing a little posterior to the beginning of the involvement of the left T_1 . On the left side the entire lower lip of T_1 is destroyed, including cortex and the larger part of the center of the convolution. The outer one-third of the dorsal surface is gone. All that is preserved is the inner two-thirds of the cortex with a narrow strip of underlying fibers.

The destruction further involves the cortex at the bottom of T_1 fissure and the greater part of the cortex of the dorsal surface of T_2 . In both places the underlying fibers are more or less affected. On the right side the lesion extends farther forward than on the left and in this section all of T_1 is absent and the adjacent angle of the island shows a defect in the cortex and underlying fibers.

Fig. 2 is of a section passing through about the middle of the

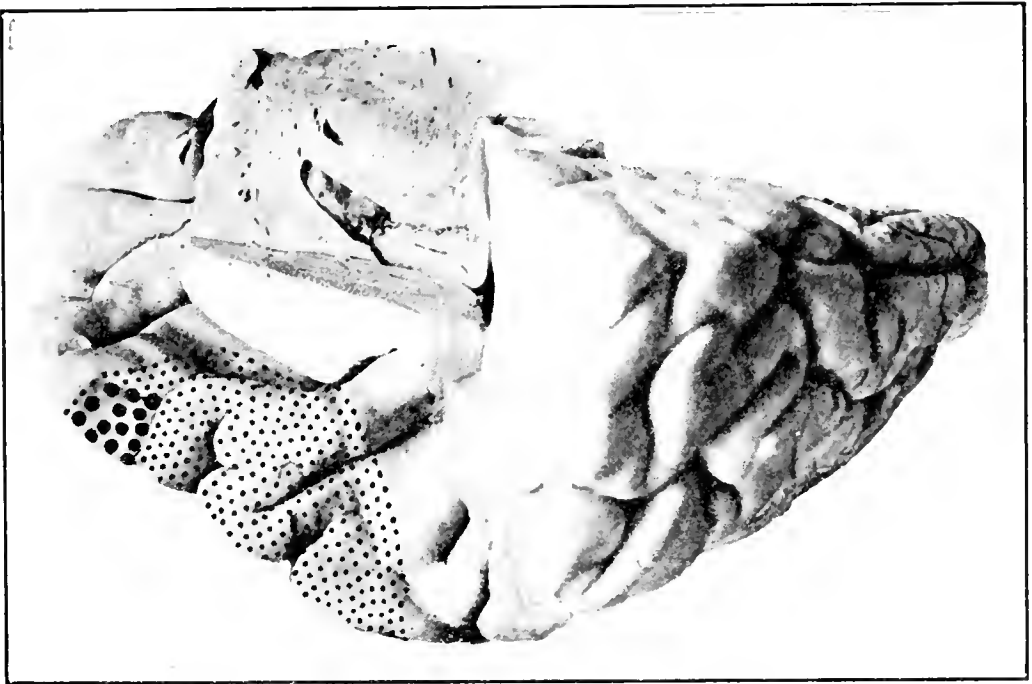


FIG. 5. Left temporal lobe, dorsal surface. In this and in Figs. 6, 7 and 8 the large dots cover those areas where the cortex and underlying fibers were destroyed. The smaller dots cover areas of cortex beneath which fibers in the center of the convolution were destroyed, but the cortex where dotted was intact.

transverse convolutions on the dorsal surface of the temporal lobe. The sections between Fig. 1 and Fig. 2 demonstrate that the lesions in their posterior continuation progressively receded from the dorsal and outer surfaces of T_1 , both of which in this section, together with a considerable number of the fibers of the center of the convolution, are preserved. On the left side the

destruction of T_2 is more extensive than farther forward, and in this section all of the cortex of the dorsal surface and most of the center of the convolution is absent. There remains preserved only the cortex of the outer surface and all of the ventral surface with a narrow layer of adjacent fibers. In this and in all other sections the cortex which remains, even close to the margin of the defect, shows no disturbance in the number and arrange-

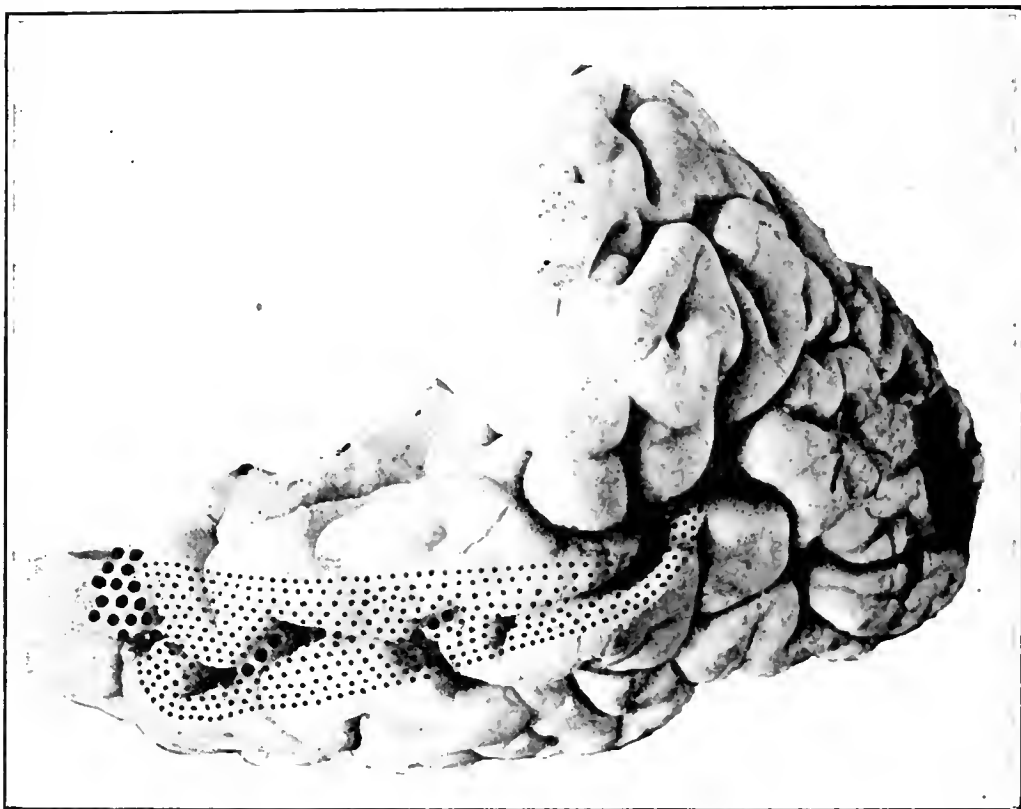


FIG. 6. Left temporal lobe, outer surface.

ment of nerve cells, and no certain loss of radial or tangential fibers. At the bottom of T_1 fissure, a triangular area extends inward; in this area fibers are greatly diminished in numbers. On the right side only the cortex of the ventral surface of T_1 is involved. T_2 , as on the left side, shows the greater destruction and here is all gone except the cortex of its ventral surface and a thin layer of adjacent fibers. The deep fiber areas at the bottom of T_1 fissure show absence of many fibers. The involvement of the island terminated some little distance anterior to this section.

The section pictured in Fig. 3 passes through the extreme posterior end of the transverse convolutions and island and through the geniculate bodies. On the left side the cortex of the ventral surface of T_1 is defective. The cortex of the upper surface of T_2 and most of the fibers of the center of the convolu-

tion are absent. The deep fiber areas of the lobe show beneath the bottom of T_1 fissure great diminution in numbers and the degeneration continues inward as a thin streak traceable as far as the lenticular nucleus. This streak occupies the position of the fiber radiations between the internal geniculate body and the first temporal convolution.

The condition on the right side is much the same. The internal geniculate bodies on both sides give no evidence of degeneration changes. Their cells are of normal appearance and their fibers abundant and deeply stained.

Fig. 4 is of a section passing posterior to the island, and through the extreme posterior end of T_1 . On the left side the lower surface of T_1 shows an absence of a narrow strip of cortex. The upper surface of T_2 is destroyed together with a considerable portion of the center of the convolution. The deep fiber area of the lobe is pale, showing great diminution in fibers, and a triangular area of fiber degeneration, in which are a few

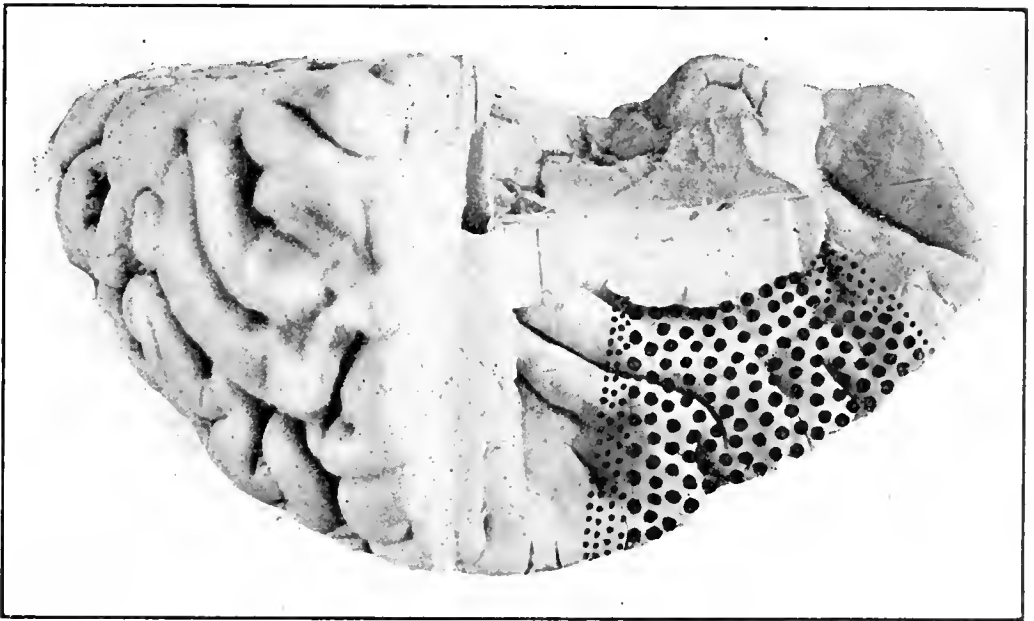


FIG. 7. Right temporal lobe, dorsal surface.

small cyst-like extensions of the softening, which pass inward, cutting through the sagittal strata near to the ventricle.

On the right side T_1 is involved only at the extreme inner portion of its ventral surface. T_2 has the cortex of the inner half of its dorsal surface destroyed and nearly all of the fibers of the center of the convolution. The degenerations in the deep fiber areas of the lobe are much the same as on the left side.

Posterior to this section the involvement of the cortex in both left and right temporal lobes is less. For a considerable distance there is marked degeneration in the deep fiber area of

the temporo-occipital lobes with small cavity extensions of the larger defects. The degeneration in the sagittal strata is present as far posterior as the strata are demonstrable. These degenerations are evidently the result of cutting the fibers by the softening rather than secondary degenerations of the fibers in their origin or termination. Nowhere can it be demonstrated that there are degenerations of the fibers of the corpus callosum.

The relations obtained from reconstruction of the lesion are shown in Figs. 5-8. These are from photographs of the dorsal and lateral aspects of the temporal lobes in which the areas, where the destruction involves the whole thickness of the convolution, have been diagrammed with large dots. The areas marked with the smaller dots indicate the parts of the convolution in which the cortex was preserved but undermined by fiber degenerations.

On the left side, Fig. 5, the cortex of nearly all of the dorsal

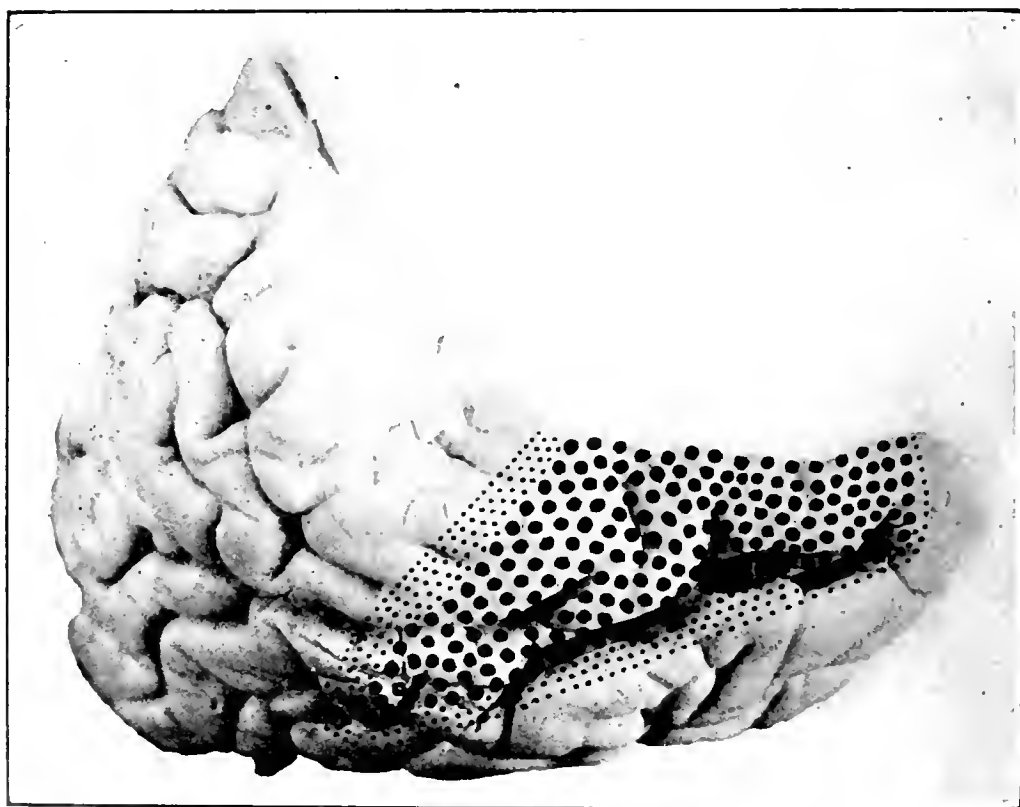


FIG. 8. Right temporal lobe, outer surface.

surface of T_1 , including all of the transverse convolutions, is preserved. The sole defect is a small area not more than 1 sq. cm. at the outer edge of the convolution, immediately anterior to the transverse convolutions. Here the defect extends through the entire thickness of the convolution, showing on the lateral surface in Fig. 6. Posterior to this position the involvement of

T_1 is confined to the lower surface of the convolution. Anteriorly the whole of this surface is gone, together with the greater part of the central fibers of the convolution. In its posterior continuation the defect progressively recedes towards the bottom of the fissure leaving more and more of the central fibers preserved. The upper surface of T_2 is largely destroyed, together with most of the central fibers of the convolution, the defect being a part of that involving T_1 . In its posterior extent it becomes more limited to the bottom of the fissure. About 1 cm. anterior to the termination of T_1 fissure, no more surface defect is present, the degeneration being confined to subcortical fiber areas.

On the right side T_1 is destroyed to the extent seen in Figs. 7 and 8. The view of the dorsal surface of the lobe, Fig. 7, shows complete destruction of T_1 from near the anterior limit of the island back to the middle of the transverse convolutions. Along the anterior half of the continuity with the island the lesion has cut out the cortex of the island and its subjacent fibers to a depth of 5 mm. The lateral view of the lobe shows complete destruction of T_1 back of the anterior end of T_1 fissure to about where the posterior and middle thirds of the convolution join. The lesion extends through the bottom of the fissure into the dorsal surface of T_2 , widening in extent of surface and depth of invasion in its posterior direction. A little posterior to the middle of T_2 it involves the convolution in its entire thickness. Back of this the lesion leaves the cortex free but extends below the fissure into the deep fiber areas of the temporo-occipital regions, along the sagittal strata to near the tip of the posterior horn. On both sides the fibers of the center of T_1 and T_2 are involved for some distance away from the surface defects. In part this appears to be the direct result of the lesion and in part secondary degenerations. The extent of this undermining of the cortex is diagrammed in the figures.

The foregoing descriptions show that a clinically unobjectionable case of pure word-deafness may result from disturbances of the cortex and underlying adjacent fiber regions in parts of the first and second temporal convolutions in both hemispheres.

The number of autopsies reported on well observed and uncomplicated cases of pure word-deafness is not large. In eleven reports which are accessible to me are found three types of anatomical lesions:

1. Destruction of the fibers in the center of the left temporal lobe, in the course of the auditory radiations from the internal geniculate bodies: Liepmann's case Gorstelle (1); Wernicke's case Hendschel, the autopsy in which was recently reported by

Liepmann (2); and a case of abscess in the temporal lobe reported by Van Gehuchten and Goris (3).

2. Destruction of cortex and underlying fiber areas, in the first and second temporal convolutions of both hemispheres. Cases reported by Edgren (4), Ballet (5), and three by Peck (6, 7, 8).

3. Atrophies of the first and second temporal convolutions in both hemispheres. Cases of Dejerine and Sérieux (9), Strohmayer (10) and Veraguth (11).

It is thus evident that in the majority of cases of pure word-deafness the lesion is different in the position from that postulated by Lichtheim and Wernicke for this type of aphasia, viz., a true subcortical involvement. With these differences it is unfortunate that all of these cases were not studied in serial sections, in order that it could be determined what the exact relations of the lesion were to those parts of the temporal convolutions whose integrity is essential for the preservation of word-understanding. In none of the cases is it possible to determine from the descriptions whether or not the relations found to exist in our case are present. The reconstruction of the relations in the left temporal lobe demonstrated that in spite of destruction of a considerable area of cortex in the left first and second temporal convolutions, there is left preserved the area which abundant evidence justifies us in regarding as the receiving station for the auditory radiations. This area is the cortex of the transverse convolutions on the dorsal surface of the first temporal convolution.

The importance of this area has been fully analyzed recently by Niessl von Mayendorf (12) in a consideration of the relation of the temporal convolutions to word-deafness. In this it is shown very convincingly that the middle portion of the left first temporal convolution and more exactly the transverse convolutions on its dorsal surface are of special importance for the preservation of word-understanding. As evidence for this he states the facts: (1) The greater number of lesions associated with loss of acoustic word-memories involve the middle part of the left first temporal convolution and the anterior transverse convolutions. (2) There is a difference in the cortical architecture of this area and adjacent regions of the first temporal convolution. (3) The fibers of this area are myelinated at an

earlier date than others near by and at a time coincident with those of the auditory radiations.

In recent contributions of Meyer (13) and Quensel (14) is given further corroborative evidence of the importance of this area as the auditory receiving station.

In our case the cortex of the transverse convolutions in the left hemisphere was intact, but the convolution was undermined throughout nearly its entire length by the degenerations in the fibers of the center of the first temporal convolution, large numbers of which had been destroyed in the softening, and there also existed a very considerable streak of degeneration in the course of the radiations between the geniculate bodies and this convolution.

In view of this the lesion present may in its anatomical relations be regarded as subcortical, at least in the manner it affects the part of the temporal convolutions essential for word-understanding. In this case as in a number of others, there is also involvement of the right temporal convolutions. This fact of the occurrence of lesions in both temporal regions in conditions of pure word-deafness has influenced Pick and some others to find the explanation for this type of speech disturbance in the general diminution of central hearing capacity which would result from such extensive injury to the cortical relations of both auditory nerves. That the existence of lesions in both hemispheres is not essential for the production of pure word-deafness is evident from the clear cases of Liepmann, and Van Gehuchten and Goris, in which there was preservation of sufficient extent of tone range, for the understanding of spoken words, but a pure word-deafness existed with lesion of the left hemisphere alone.

This fact together with the known importance of the left hemisphere for speech function and the very extensive destruction of the transverse convolutions in the right hemisphere in our case of Taft, has seemed to us ample justification for regarding the involvement of the left auditory relations as the important one for the production of the pure word-deafness; and that the condition is the result of the isolation of the receiving station in the transverse convolutions in the left hemisphere by an anatomical lesion affecting its fiber relations with the internal geniculate body.

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THE REFLEXES IN HYSTERIA¹

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In his latest article upon hysteria, Babinski (1) again maintains the thesis which he originally advanced sixteen years ago (2), that "hysteria is incapable of modifying the tendon reflexes and that, consequently, pure hysterical hemiplegia is never accompanied by an exaggeration of those reflexes." In a previous article (3) and in the discussions at the congress of French-speaking alienists and neurologists at Geneva-Lausanne (4) and at the meetings of the Société de Neurologie at Paris (5), he has claimed that only those symptoms which can be reproduced by suggestion and removed by persuasion should be regarded as hysterical. Since the reflexes cannot be influenced in this way he believes that hysteria has no effect upon them.

These opinions have met with considerable support, especially in France. In the discussions before the Société de Neurologie, Ballet, Thomas, Meige, Souques, Brissaud and Dupré ranged themselves on Babinski's side. Dutil and Laubry (6) assert that in hysteria the tendon reflexes are never abolished or exaggerated, and that the abolition of the cutaneous reflexes, especially the abdominal and cremasteric, is presumptive evidence of an organic lesion. Similar statements are made by Ziehen (7) and Gordon (8). Even Janet (9), who is by no means ready to accept Babinski's whole teaching on the subject, admits that, while there is some exaggeration of the tendon reflexes, the cutaneous reflexes, especially the abdominal and cremasteric, remain unaltered.

Such an assumption is certainly at variance with the statements to be found in the majority of the older works on hysteria and diseases of the nervous system. The accepted opinion has been that the cutaneous reflexes are usually diminished in those regions where sensibility is diminished, although this is less apt to be true of the abdominal and cremasteric reflexes. The

¹ Read at the thirty-fifth annual meeting of the American Neurological Association, May 27, 28 and 29, 1909.

Babinski and Oppenheim reflexes are never caused by hysteria. The tendon reflexes are often exaggerated, but within normal limits, and, in hysterical hemiplegia, they are often greater upon the paralyzed side. Whether hysteria can give rise to ankle clonus or loss of knee-jerk is very doubtful.

One of the most recent studies upon the reflexes in hysteria has been made by Crocq (10), who has, however, studied only the question of the presence, the absence, or the exaggeration of certain reflexes in one hundred cases of hysteria, and has paid no attention to the question of the differences between the reflexes on the two sides of the body. I have, therefore, studied some of the more important tendon and cutaneous reflexes in one hundred cases in which I have made the diagnosis of hysteria and in which there was a difference of sensibility in the two halves of the body. Of these cases thirty-five were males and sixty-five females; in forty-four the sensibility was diminished on the right side, and in fifty-six it was diminished on the left. In most of these cases the diminution was only relative; total anesthesia is a very rare phenomenon in the cases of hysteria that have come under my observation. Most of them showed some weakness on the hypesthetic side, but total paralysis of hysterical origin is as rare as total anesthesia.

I am aware that this principle of selection at once exposes me to Babinski's criticism, that hemianesthesia in hysteria is merely an artefact, due to unconscious suggestion by the physician or to auto-suggestion by the patient. He objects to any inquiry whether the patient feels more distinctly in one part of the body than in another, and asks simply "What do you feel?" It is, however, impossible to determine the slighter disturbances of sensibility without employing some form of this comparative method. I have repeatedly seen patients with hypesthesia, not of hysterical origin, who could perceive the most delicate tactile stimulus, the lightest touch with a soft brush or Frey's hair esthesiometer, yet who could not perceive such a touch as distinctly as in other regions. Only by this comparative method have I succeeded, in many instances, in discovering the sensory disturbance in nerve injury, in cerebral hemorrhage and in tabes. Were we to depend upon Babinski's cruder methods many cases would pass undetected. His own method of proving that a patient has not hemianesthesia because she feels the pain of a strong faradic

current is as convincing as it would be to prove that a patient had normal vision because she saw the flash of an electric light. His claim of unconscious suggestion on the part of the physician is old and was repeatedly urged in the discussions upon the traumatic neuroses. It is certainly hard to explain segmental anesthesia of the sleeve, glove or stocking type, analgesia with normal tactile sensibility, or a hypesthesia involving one-half the body yet sparing the face when the sensibility of the face is tested before that of the body, by any hypothesis of unconscious suggestion on the part of the examining physician. Thomas's suggestion (11) that hemianesthesia is commoner than anesthesia of the legs because the physician usually compares the two halves of the body, and not the arms and legs, and Meige's notion (11) that left hemianesthesia is commoner than right because a right-handed examiner would naturally test the left side first are simply amusing bits of special pleading. The danger of suggestion should be borne in mind; but to reject the comparative method of testing sensibility because of this danger would be to abandon a very valuable method of investigation.

We labor under the great disadvantage that there is, as yet, no definite criterion for the diagnosis of hysteria. Not only is there no known pathological basis, but there is no definite group of symptoms, as in exophthalmic goitre or tabes, which is generally accepted as affording a clinical warrant for our diagnosis. Until such a criterion is found, therefore, the diagnosis of hysteria must always be made with certain reservations and our conclusions as to the existence or non-existence of certain symptoms in hysteria due to hysteria itself must remain somewhat uncertain.

Babinski, Janet and Crocq have dwelt at length upon the precautions which are necessary in testing the various reflexes and the possible sources of error in observation. The chances of error are of course great unless the observer has made a special study of the various reflexes and has had much experience in testing them, but I trust that the percentage of error in this series of cases has been reduced to the minimum.

Crocq found the tendon reflexes exaggerated in seventy-nine of his hundred cases, the exaggeration being so great in some instances as to amount to clonus, ten cases showing ankle clonus and five patellar clonus. In my own cases there was some exaggeration in eighty-six, which showed that moderate degree of

exaggeration manifested by the patellar twitch. Forty-one showed front tap contraction and seven a spurious ankle clonus. In no case did I find a true ankle clonus or an absence of knee-jerk. There was a little more exaggeration than Thomas and I (12) found in presumably healthy people under conditions of considerable excitement, in Marathon runners before a race, where forty-four out of forty-nine (ninety per cent.) showed a patellar twitch, eighteen (thirty-seven per cent.) a front tap contraction, and one (two per cent.) a slight spurious clonus. It is true that this amount of exaggeration may occur in healthy persons, but there are a larger number of persons with these lively reflexes among hysterical and neurasthenic patients than among healthy persons, so that it is fair to assume that hysteria, like neurasthenia, may cause a moderate exaggeration of the tendon reflexes.

When it comes to pathological states of the tendon reflex—true clonus and loss of knee-jerk—I must confess that I am still skeptical as to whether they may be caused by hysteria. In regard to ankle clonus Sternberg (13) claimed that it occurred in twenty per cent. of the cases of hysteria, and Binswanger (14) apparently endorses his claim; Crocq's percentage is less, and a number of competent observers, Charcot (15), Richer (16), Buzard (17), Strümpell (18), Sachs (19), Oppenheim (20), and Van Gehuchten (21) claim to have seen true clonus in hysteria. A complete loss of knee-jerk has also been observed in hysteria by a few observers—Dejerine (22), Steiner (23), Marie and Souza-Leite (24), Nonne (25) and Wigand (26); and Charcot and Richer (27) claimed years ago that the knee-jerk was lost in the cataleptic stage of hypnotism. I must confess that I should feel very doubtful of the diagnosis in any case of hysteria which showed a true clonus or a loss of knee-jerk; yet the temporary loss of knee-jerk after extreme fatigue, as found by Thomas and myself in certain Marathon runners and confirmed by several observers since, suggests that there may be conditions of exhaustion in hysteria sufficient to abolish the knee-jerk.

While there may be some question as to the significance of such exaggeration of the tendon reflexes as I have noted, or as to the existence of such pathological reflexes in hysteria, we must admit that a difference between certain tendon reflexes—the knee-jerk and ankle-jerk—on the two sides does not occur in

health and may fairly be regarded as pathological. In this series of cases a difference was noted in one or both of these reflexes fifty-seven times, thirty-seven times for the knee-jerk and thirty times for the ankle-jerk. In six cases there was a unilateral spurious clonus. In thirty-eight cases the tendon-reflex was greater on the anesthetic side, in nineteen it was greater on the opposite side. The exaggeration on the anesthetic or paralyzed side is noted by all writers who admit any alteration of the tendon reflexes in hysteria, and is the more frequent condition, but Weir Mitchell (28) many years ago noted certain exceptions to this rule, and these cases show that the exceptions are fairly common.

Turning now to the cutaneous reflexes it will be admitted that the plantar and cremasteric reflexes are very constant and that the abdominal reflex is sometimes absent in health, but that, when present, these reflexes are alike on the two sides. Crocq has found complete absence of the plantar reflex in hysteria in twenty-four cases; I have found it absent in only two cases, but in forty-seven it was absent or diminished on the anesthetic side. In no case did I note the Babinski or Oppenheim reflex, which is in harmony with the findings of Crocq and of most other observers except Van Gehuchten (29), who has reported one case in which he made a diagnosis of hysteria and found a Babinski reflex. Crocq found Babinski's "fan" reflex—the spreading of the toes—in eight cases. This I have failed to note. In twenty-four cases out of fifty-one the abdominal reflex was diminished or lost on the anesthetic side; and in two cases out of twenty-four the cremasteric reflex was diminished on that side.

In the whole series of cases seventy-six showed a difference in one or more of the tendon or cutaneous reflexes on the two sides of the body; the skin reflexes being diminished on the anesthetic side, the tendon reflexes being often increased but sometimes diminished. I have found similar alterations in the reflexes in many other cases of hysteria not included in this series, and the results of my own experience are in harmony with the opinions formerly expressed by other writers. The results seem to contradict the claim of Babinski, that hysteria is incapable of modifying the tendon reflexes. An alteration of the reflexes in hysteria is too common to warrant any attempt to explain it away, as Babinski has tried to do, by asserting that it is no more common than in non-hysterical persons or that it is due to some

co-existing condition or to errors in observation or in diagnosis. Hysteria apparently does modify both the skin and tendon reflexes, and this, of itself, is one argument against Babinski's doctrine of pithiatism.

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PERIOSTEAL CYST FORMATION. AN UNUSUAL EFFECT OF INTRACRANIAL PRESSURE¹

BY E. W. TAYLOR, M.D.

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The object of this communication is primarily to call attention to an unusual condition following intracranial pressure in the case of a man operated upon for brain tumor, and secondarily to the exceptional symptoms dependent thereon.

The patient when first seen, on August 25, 1905, was 35 years old, a man of exemplary habits, who, for somewhat over three years, had suffered from epileptiform attacks, the first of which had occurred while at luncheon with his business partner. From that time to his death, September 7, 1907, he was unable to resume his employment. For several years he had been treated for idiopathic epilepsy, and that diagnosis seemed also to me the most probable for a year or more after he first came under my observation. Associated with infrequent attacks of grand mal, there were many minor attacks of petit mal which lent further weight to the general diagnosis of epilepsy. During the earlier period of his illness there was indefinite complaint of loss of memory and a highly developed introspective attitude. Occasional vomiting and some headache supervened, which at first suggested migraine rather than a more serious condition. The onset of double optic neuritis was definitely established in May, 1906, at that time a swelling of about 4 mm. being present in the right eye and one of about 2 mm. in the left eye, with unimpaired vision. The localization of the new growth which was now evidently the cause of the symptoms was difficult.

A careful observation of the onset of the relatively infrequent epileptiform attacks showed a predominant involvement of the right arm, but nothing else pointed distinctly toward a focal lesion. After some hesitation the decision was made of attempting to reach the tumor through an opening over the left arm area. The operation was done by Dr. F. B. Lund on January 27, 1907. A large osteoplastic flap was laid back over the mid-frontal area. The dura was under great pressure. It was widely opened with secondary bulging of the brain. The cortex was edematous, but except for the pressure was entirely normal in

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the area investigated. Care was taken not to expose the third left frontal convolution, and the brain studied post-mortem showed that this had not been done. Following the operation which was completed by a return of the skin flap after removal of the bone and dura, the usual bulging of the brain occurred and with it a practically complete aphasia of the so-called motor type, associated with a somewhat definite intellectual defect, which persisted in varying degree up to his death six months later.

The complete history of the case is of sufficient interest to report in detail at another time. My purpose now is merely to call attention to the extraordinary pathological process which took place subsequent to the operation, and to its relation to the aphasia.

By degrees, during the remainder of his life, the bulging tumor over the seat of operation became soft and fluctuant. This varied, however, materially from week to week or even from day to day. At certain times the swelling was tense and apparently under great pressure; at others, for no ascertainable reason, it became soft and felt as if containing either fluid or some softened material.

Clinically, it was observable that when the swelling was tense the patient's mental state was much obscured and his persistent aphasia almost complete. When the pressure diminished, however, a very marked improvement in the clinical symptoms forthwith manifested itself. This phenomenon was not properly interpreted during life, doubtless due to the fact of the preconception since normal brain cortex had been found at the seat of operation that such changes in tension must be due to causes within the ventricles.

The patient died exactly six months after the operation, having been relieved decidedly of his distressing symptoms of headache, vomiting and epileptiform convulsions and without at any time the development of paralysis, with a persistent aphasia which improved slightly, but at no time gave place to normal speech.

The report of the autopsy by Dr. S. B. Wolbach follows in detail.

Autopsy.—September 7, 1907, two and one half hours post mortem. Examination limited to head. Body of a tall, well-developed, and well-nourished white man. Rigor mortis present. Pupils are equal, 4 mm. On the left side of the head occupying nearly the whole frontal and parietal regions is a large tumor completely covered by the scalp. The portion of the tumor showing externally is nearly spherical in shape. Consistency soft and fluctuant. At the base roughened bony outlines can be felt marking the outlines of the operation wound. The base of the hernia measures 13 inches in circumference. From the tip

of the mastoid process to the median line measured over the hernia is 9 inches, on the right side the similar measurement is $7\frac{1}{2}$ inches. The posterior margin of the hole in the skull is on a line drawn between the two external auditory meati. The outer border of the opening is 1 inch to the left of the median line, the external border $2\frac{1}{2}$ inches above the external auditory meatus. The hair is abundant, long, wavy, black. The scalp is normal, though slightly discolored red where it covers the hernia. There is a definite plane of cleavage between the scalp and the membrane covering the hernia, and this plane of cleavage is continuous with that between the scalp and the periosteum. In a few places where the bone is elevated at the edge of the operation wound the scalp is slightly adherent to the periosteum. With the scalp removed the hernia appears as a lax translucent walled cyst, which overlaps the opening in the skull about 1 to 2 cm. in different places. An incision into the skull reveals a cavity traversed by delicate brownish red, friable bands. The wall is covered in most places by a thin, soft material. The floor of the sac is composed of brain tissue, and is crater-like in shape, tapering downwards, forwards and inwards, to two small openings; which communicate with the ventricle of the left cerebral hemisphere. All along the periphery of the hernia sac, above the level of the bone there are small cavities containing clear liquid, and brain tissue, occupying spaces between the dura and the pia, and possibly between the dura and periosteum. By elevating the periosteum about the opening in the skull the hernia sac is easily freed from the bone, and it is found that the periosteum and dura fuse at the bony margin. After freeing the hernia from above, the calvarium is removed in the usual way. The opening in the skull is roughly elliptical in shape. The greatest diameter which runs backwards and outwards is $3\frac{1}{2}$ inches, and the greatest transverse diameter is $2\frac{1}{2}$ inches. The posterior border touches a line drawn between the two external auditory meati. The inner border is $\frac{3}{4}$ inches from the median line, the external border $2\frac{1}{2}$ inches above the external auditory meati. Along the periphery of the opening in the skull the bone on the external side is elevated into an almost continuous ridge varying from a few millimeters to 1.5 cm. This new formed bone is slightly rough and in places reddened. The calvarium, otherwise, is of usual thickness containing a fair amount of diploë. On the inner surface on the right side at about the position corresponding to the junctions of the parietal and occipital lobes, and 2 cm. from the median line is a deep pit in the inner table, 2 mm. in diameter. There are numerous minute depressions along the superior longitudinal sinus corresponding in position to the depressions of the Pacchionian granulations.

. *Brain.*—The dura is normal in thickness. Corresponding to the depression in the skull on the right side is a soft, grayish

yellow elevation which on stripping the dura slips out and remains attached to the brain. On both sides of the superior longitudinal sinus the dura is adherent to the brain at points corresponding to the Pacchionian granulations, abnormally so because of the tearing of the brain tissue leaving small ragged points. The pia is slightly clouded over both fissures of Sylvius, more markedly so on the right side where it has a brownish color. The brain is tightly adherent to the base of the skull on account of a tumor mass which emerges from the base of the brain to the left of the median line, just anterior to the pons, and which has displaced the optic tract and temporal lobe outwards. Anteriorly the tumor extends to the line of the anterior communicating artery. The tumor extends subdurally and occupies a position in the floor of the middle fossa apparently having gone through the great wing of the sphenoid. The brain is removed by chiseling out the orbital plates and the body of the sphenoid. The fifth nerve runs into the tumor mass and is nearly completely surrounded by it. A single incision is made into the left ventricle and shows that the hernia sac communicates with the cavity of the ventricle. The brain is hardened *in toto* in 10 per cent. formalin for further study. On stripping the dura from the floor of the skull many small pits are found in the middle fossa on the right side. These pits vary in size from 1 to 3 mm., and are nearly hemispherical in shape. Corresponding to these depressions are smooth, soft grayish elevations on the external surfaces of the dura. Projecting into the right lateral sinus in about its middle portion, from the upper surfaces is a mound of soft gray tissue. On the external surfaces corresponding to this place is a ragged remnant of brain tissue.

Anatomical Diagnosis.—Tumor at base of brain. Post-operative cerebral hernia, with periosteal cyst formation. Internal hydrocephalus. Multiple cerebral hernia due to intracranial pressure.

Later microscopic examination showed the tumor to be made up of cells of the sarcomatous type. The exact point of origin of the growth was not determined, but the bones of the base of the skull were extensively involved.

The foregoing case presents various points of interest, both on the clinical, pathological and surgical sides.

The diagnosis of the condition was vague for at least two years after the beginning of the disease. The first sign was an epileptic seizure which in itself threw no distinct light upon the underlying condition. Inasmuch as this seizure took place nearly three years before his death it is evident that slow-growing as the tumor may have been it was then insignificant in size and

incapable of producing any high degree of intracranial pressure. Its location at the base of the brain, however, with possible involvement of the Ammon's horn region may have been significant in this early production of epilepsy. However this may be, the point can hardly be too much emphasized that an epileptic attack after the age of thirty in the absence of a syphilitic history is at least strongly suggestive of tumor. Several similar cases have come under my observation. In regard to the epileptic attacks which the patient had, it is furthermore of interest that they occurred at wide intervals of time and that at first it was impossible to attribute to them any focal significance. In the early stages of the disease and in fact until the time of operation there was no speech defect whatever. Headache was at no time a conspicuous symptom and what little there was was unassociated with vomiting. At one period in the course of the disease a diagnosis of migraine seemed justified. The later development of an optic neuritis which became high in degree was a determining factor in the final diagnosis. Previous to the operation the clinical facts of interest were, therefore, early epileptic seizures which for a long period so far dominated the clinical picture as to justify a provisional diagnosis of idiopathic epilepsy, practical freedom from headache or other signs of intracranial pressure until the development of an optic neuritis determined the diagnosis. Mentally the patient showed no further disturbance than was to have been expected from a young man of unusual intelligence and promise who felt keenly his responsibilities in life and his increasing incapacity to bear them. He was introspective, dazed at times for very brief periods, probably attributable to attacks of petit mal, but he at no time failed to appreciate his condition and was entirely capable of arranging personally for the operation.

The surgical aspects of the case apart from the ultimate results are of more than usual interest. After careful consideration and study of the epileptiform attacks which had occurred immediately before the operation was decided upon it seemed probable that the growth lay on the left side, presumably in the neighborhood of the arm area. The evidence as given by the family pointed toward a predominant involvement of the arm in the epileptic attacks preceding the more general convulsions and this seemed also to have been a recent development. In view of this

fact the left hemisphere was exposed over and somewhat anterior to the arm area. The pressure was extreme with every evidence of the speedy formation of a pressure hernia. The dura was removed and the brain not injured in the process. A lumbar puncture was not attempted nor was other effort made to relieve the situation or to find the tumor which manifestly was not on the surface in the area exposed. The immediate result of this operation carried out with the most scrupulous care was a practically complete aphasia, essentially of the so-called motor type, although it was evident as the autopsy subsequently proved that Broca's convolution was in no way directly invaded. In view of this wholly unexpected result it was particularly surprising that there was absolutely no weakness of the right arm.

The patient made a good general recovery from the operation with relief of what headache he had had, of the epileptiform attacks and of the optic neuritis, but with a persistent aphasia of extreme degree which persisted with slight modification up to the time of his death six months later, but without other paralytic symptoms.

In view of this outcome several matters of surgical importance suggest themselves. First, in spite of the risk attendant thereon it would no doubt have been wise to have reduced the immediate intracranial pressure at the site of the skull opening through lumbar puncture; secondly, the question arises as to the wisdom in this case on somewhat slender evidence of attempting to find the tumor. The event proved that had a simple decompression been attempted on the right side in the usual temporal region the patient would have been spared the distressing aphasia which rendered the remainder of his life a great hardship not only to himself, but especially to his family. The question of operating in cases of brain tumor in such a way as to attempt to find the tumor as advocated by Frazier or on the other hand to prepare the way for a subsequent search for the growth by a purely palliative operation as urged by Cushing must invariably be determined on the merits of the individual case. If the conditions are such that repeated operations may be attempted without too great mental shock to the family or to the patient, Cushing's course would seem to be advisable. It frequently happens, however, that one operation is all that can, with propriety, be urged and in that case an effort to reach the tumor at the expense even

of some risk is justified. In this instance the two alternatives were carefully considered with the somewhat disastrous result which has been stated. In the third place, having operated on the left side, the condition might no doubt have been at least in part alleviated by a counter opening over the other hemisphere as strongly urged by Cushing. Here again the prejudice against further interference must be taken into account from the practical standpoint. It is, however, interesting to speculate upon the effect this might have had upon the aphasia and upon the extraordinary secondary pathological process which took place in this case as a result of the unilateral operation. In the fourth place, had it been possible to recognize the contents of the cranial sac as fluid, would tapping of the cyst have been justified? This would at best have been merely a palliative procedure and one not unattended with grave danger inasmuch as the cyst cavity connected directly with the ventricle, which also would have rendered difficult the proper control of the amount of fluid to be withdrawn.

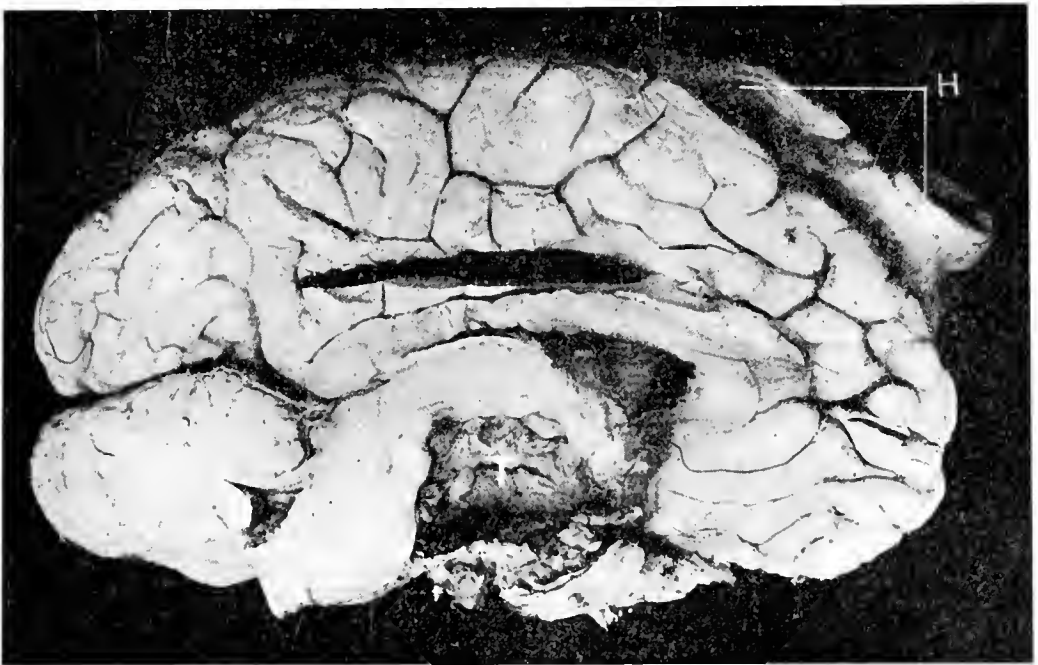


FIG. 1. Mesial surface of left hemisphere, showing tumor at base of brain. Artificial invasion above corpus callosum. *T* wall of terminal sac.

The location of the tumor was unexpected and could not have been localized definitely during life. The remarkable escape of the chiasm and of other cranial nerves due to the somewhat

lateral position of the growth at no time permitted accurate diagnosis. The involvement of the fifth nerve on one side shown post-mortem was not determined during life possibly through carelessness of observation. The patient neither before operation nor after gave expression to complaints referable to this nerve. The pathological matter of chief interest in the case was the formation of a cyst far removed from and absolutely independent of the tumor, together with the extraordinary effort at repair made by natural processes to reduce and provide for the intracranial pressure. The power of growth of the periosteum is well recognized, knowledge which has been used with remarkable results in the restoration of diseased bones through operation. The overgrowth of periosteum to fill skull defects, as I have observed, for example, in the now discarded operation of craniectomy for defective mental development, is also well recognized. It is, however, a less common experience after an extensive operation on the skull in an adult disclosing normal brain substance to see a complete erosion of cortex and underlying white matter leading to a porencephalic defect with coincident periosteal cyst formation. This case is reported cursorily at this time to call

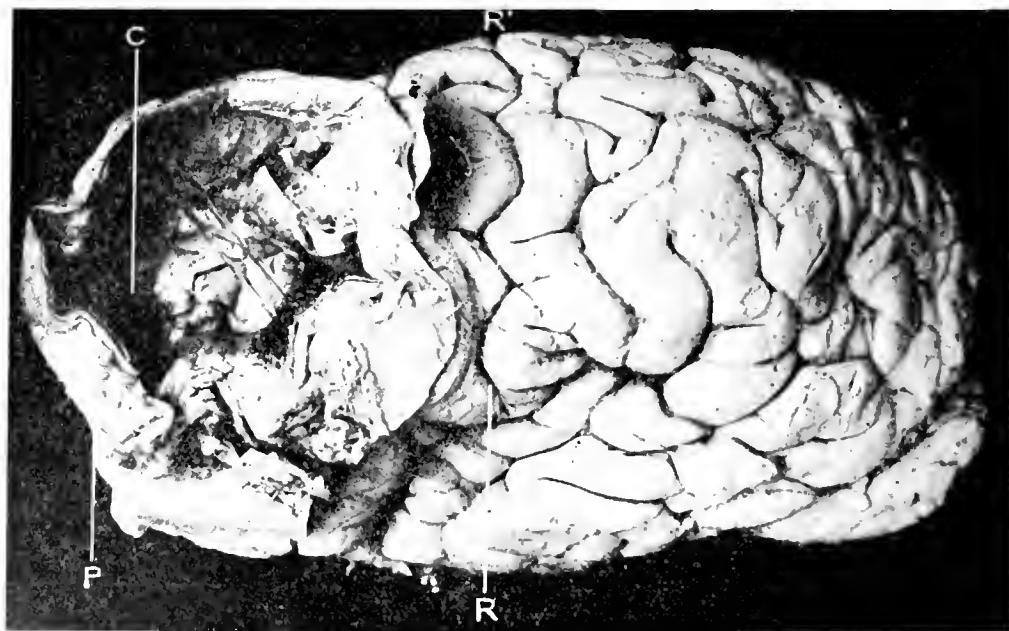


FIG. 2. Outer surface of left hemisphere, showing cyst formation with destruction of underlying brain substance. The photograph exaggerates the size of the cavity, owing to the fact that the cyst wall is laid back over normal cortex. The precentral convolution is not invaded, nor is Broca's convolution. *R'*, *R*, Fissure of Rolando. *C*, Cyst cavity. *P*, Periosteum, with dura beneath.

special attention to this phenomenon and its effects, unique in my experience.

The mechanism of the formation of the cyst must, of course, be attributed to intracranial pressure, naturally finding a point of least resistance at the extensive operative skull opening. The result of this pressure gradually led to a destruction of the brain substance lying between the anterior horn of the ventricle and skull opening (the dura had not been replaced). When the cyst was opened at the autopsy the appearance was precisely that of a crater with smooth walls constituted by the white matter, connecting directly with the ventricle by two openings as previously described. This had been accomplished together with the periosteal overgrowth forming the external portion of the cyst in exactly six months. During these six months it was repeatedly observed that the patient's symptoms might be somewhat accurately determined from the tenseness of the hernia. As before stated, when the hernia was relatively soft and fluctuant the patient was more comfortable, was able to make himself understood better, his limited vocabulary was much more available and he showed a marked degree of normal interest in his surroundings. When on the other hand the hernia was tense the symptoms were all manifestly worse. It was not possible to determine what caused these differences in pressure, but it was evident that in the condition of the hernia, not then recognized as a cyst, there was a very definite criterion of brain function.

The general development of the symptoms following the operation were evidently due directly to the formation of this destructive cystic cavity. The extraordinary features of the post operative situation were, first, the unexpected freedom of the right arm from paralysis, and secondly, the immediate onset of an almost complete aphasia, although neither Broca's convolution, the first temporal convolution nor the lenticular zone were invaded by the growth or by the cyst formation.

The skull opening through which the cyst protruded was slightly anterior to the arm area as shown by autopsy. The entire precentral convolution was intact and no doubt the crater-like cyst formation did not invade the arm fibers. It is a noteworthy fact that so extensive a lesion should have existed in the closest possible proximity to the arm area with absolutely no disturbance of function. Frontal sections through the brain likewise showed no involvement of the third left frontal convolution

or of the lenticular region. It is also to be remembered that the aphasia was an immediate symptom following the operation and tended toward improvement in spite of the increasing brain destruction. In view of these facts it is difficult to find an adequate explanation of the pronounced speech defect on the basis of the ordinary localization of the speech area. It is possible, and in fact there seems to be no other explanation, that the shock of

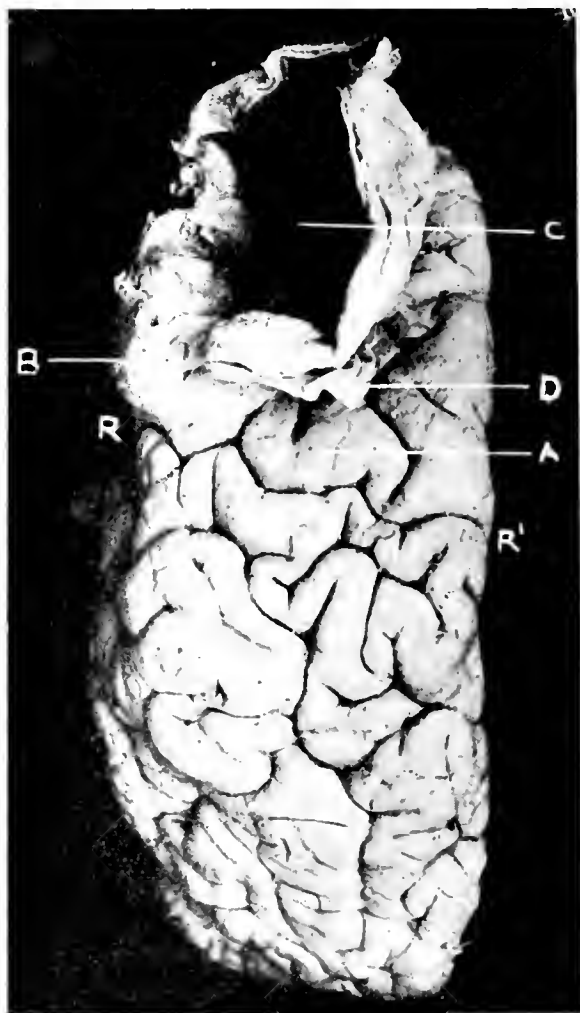


FIG. 3. Left hemisphere viewed from above. *R'*, upper; *R*, lower end of Fissure of Rolando. *A*, arm area. *B*, Broca's convolution. *D*, dura. *C*, cyst cavity.

the operation with the immediate hernia from pressure may so far have disarranged, through traction, the transmitting fibers which subserve speech that the aphasia was immediately produced, and secondarily that recovery of speech was hindered by the general progress of the disease and by the development of the cystic cavity still further involving these fibers. It is further-

more of interest that a large part of the frontal lobe of the left side was destroyed which conceivably might have had some relation to the persistence of the speech defect through disturbance in the higher intellectual processes. The aphasia, however, was not a pure mental defect as that term is ordinarily used, nor, as has been said, was there the slightest lesion of the temporal or lenticular zones which would lend weight to the explanation of the aphasia on grounds advanced by Marie. Before the operation there was absolutely no such speech defect, hence general pressure cannot be regarded as primarily operative. When, on the other hand, pressure was relieved by operation, the aphasia forthwith developed, although no recognized speech area was invaded.

According to the generally accepted nomenclature the aphasia was essentially of the motor type; an almost complete loss of vocabulary was its most essential characteristic. With this went an imperfect understanding of commands if at all complicated, difficulty in copying and in spontaneous writing (inability, for example, to write questions he wished to ask), lack of visual comprehension, imperfect capacity to name objects and occasional misuse of objects.

Without at this time going into detail regarding a case of considerable importance in the study of aphasia, the following facts are at once apparent—that the aphasia was of a complex type and that its apparent causative lesion was definitely localized in a part of the brain to which no important speech function has ever been assigned. The supposed area for writing at the base of the second left frontal convolution was apparently destroyed with merely a partial writing incapacity, easily explained by the existence of more fundamental language defects. It seems difficult to bring this case into accord with either of the conflicting anatomical theories of aphasia. Broca's convolution cannot be held responsible for the loss of vocabulary, since it was uninvaded, nor can Marie's lenticular zone which also showed no lesion. General pressure sharply localized by the operation over the left prefrontal region must certainly be held responsible for the speech defect in this case, however explained. This fact may be of some value in upholding those who believe that speech is a function of the whole brain and that our attempted localizations may all be modified in favor of a broader conception of cerebral function.

Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

October 5, 1909

The President, Dr. J. RAMSAY HUNT, in the Chair

A CASE OF POLIOMYELITIS WITH UNUSUAL FEATURES

By J. F. Terriberly, M.D.

The patient was a female child, one year old, whose history dated back three weeks. When Dr. Terriberly first saw the case, ten days ago, there was complete paralysis of the abdominal muscles on both sides, so that the child was unable to cry aloud or make any sound unless pressure was exerted on the abdomen, when a faint sound could be elicited. Abdominal reflexes were absent.

The left leg was held in a spastic condition, and a well-marked knee jerk and clonus and Babinski phenomenon on this side were present, while the opposite leg was in the usual condition of relaxed or atonic paralysis. Dr. Terriberly said there had been some improvement in the child's condition since he first saw it, but the original features of the case were still very apparent. The clinical picture here shown illustrates well the fact that the ravages of this disease storm are sometimes more destructive in other than the anterior horn region of the cord.

A CASE OF ACROMEGALY

By E. G. Zabriskie, M.D.

The patient was a man, thirty years old; a tailor by occupation, married three years, no children. He denied venereal disease and the excessive use of alcohol. There is no history of similar affection or gigantism in the family. For the past eight years he had suffered from left supraorbital headache and from paresthesias in the right half of the nose, paroxysmal in character and accompanied by scotoma. He had never suffered from generalized headache; there was no history of nausea nor tinnitus. Six years ago he began to experience paresthesia and weakness in the fingers of both hands; this would persist for about two hours in the morning and would then pass away. About three years ago he first noticed that the right half of his face was swollen. About nine months ago his fingers began to increase in size; this gradually proved an embarrassment to his work as a tailor, and for the past two months he could not work at his trade at all, as he was unable to wear a thimble or hold the needle. He had increased nine pounds in weight during the past three months. He slept well; his appetite was good; bowels regular.

At the present time, the patient's face showed marked asymmetry, the right half being decidedly larger than the left. The right malar bone was very prominent, protruding in such a manner as to give the impression of twisting of the face. This enlargement of the face was more noticeable in the bony structures than in the soft parts, and included the bones of the right half of the cranium. The unequal distribution of the enlargement embarrassed the movements of the jaw and rotation of the head, and caused slight crackling of the joints. The innervation of the lower right half of the face was greater than the left; that of the upper was equal. The tongue protruded slightly to the right; there was no difference in the size of the two halves. The ears were of equal size. There was a decided loss of hair over the left ear and top of head. The hair of the right side of the head was thin; that of the beard seemed to be normal. There was no disturbance of the eye-grounds nor limitation of the fields of vision. No papillitis; no evidence of any tumor formation. The enlargement was also to be seen in the hands, and the fingers were evenly enlarged. The right arm was slightly longer and larger than the left, and there was a similar difference in the size of the two hands. The feet were beginning to show enlargement. The X-ray showed that the right halves of the cervical vertebræ were slightly larger than the left in that the transverse processes were all more massive and appreciably longer.

A CASE OF MULTIPLE SCLEROSIS WITH GENERAL PARALYSIS

By G. Y. Rusk, M.D.

The patient was a woman with a history of syphilitic infection, who at the age of thirty began to show lameness and pains in the legs, which gradually developed into a spastic paraplegia with sensory disorders and weakness of the extensors; who showed marked incoördination, tremor of the hands, face and tongue, speech and writing disorder of the paretic rather than the multiple sclerotic type; Argyll-Robertson pupils and the history of slight convulsive attacks. There was no nystagmus; no scanning speech. The psychosis was a mild excitement and the onset with slight memory defect and a lack of adequate adjustment to environment. The diagnosis presented distinct uncertainties, both from the mental and physical side; although the probability of paresis or of psychosis accompanying cerebro-spinal syphilis was considered, the physical symptom-complex did not suggest multiple sclerosis. The interest in the case anatomically lay in the combination of so rare a condition as multiple sclerosis with the comparatively common general paralysis. The lesions of the former were distinct and adequate for the diagnosis. In the latter condition, the only feature which presented difficulty was that the distribution of the chronic inflammatory exudate was somewhat more marked in the parts affected more severely by multiple sclerosis than in the cortex, where the brunt of the inflammatory condition was apt to fall in a typical paretic.

The president, Dr. J. Ramsay Hunt said that, a few years ago, he had recorded a case of multiple sclerosis in conjunction with dementia paralytica. Clinically the diagnosis was not made and presented many

difficulties; at autopsy the typical cortical lesions of paresis were found, combined with those of cerebro-spinal multiple sclerosis. Such cases are apparently very rare and all of the recorded cases seem to have presented great diagnostic difficulties. Some of the older cases apparently belonged to the diffuse sclerosis and were not examples of true general paralysis.

A CASE OF EPILEPSY WITH MULTIPLE CORTICAL FOCAL SOFTENING

By G. Y. Rusk, M.D.

The patient was a man 63 years old who had shown mental peculiarities for ten years previously. His initial history was inadequate, especially that relating to the onset of his convulsive attacks, or as to the possibility of specific infection. His period of excitement soon subsided, and he lapsed into an affable, mild, demented state, having a series of convulsive attacks averaging about two a month. The autopsy in this case showed cerebral arterial fibrosis, with multiple fine cortical and sub-cortical focal lesions. There was slight bronchitis and pulmonary edema of the lower lobes; also chronic mitral valvulitis leading to stenosis and chronic interstitial nephritis. The feature of interest in the case consisted in the peculiar form of arterial lesion in which many of the terminal arteries appeared as fine white threads running over the convexity of the cortex, especially over the posterior half, although the frontal portion presented a few such vessels. The disturbance of the circulation was further shown grossly by the formation of a remarkably diffuse network of venules distributed especially in those regions where the arterial occlusion was more marked. Macroscopically, the arteries showed practically more of the ordinary arteriosclerosis, but the affected ones were usually completely occluded by a webby fibrous tissue mass in which few nuclei were present. The vessel, as a whole, was usually shrunken, the muscle had more or less disappeared or become hyaline, the elastica was usually fairly well preserved and the adventitia converted into a loose acellular network. The pia generally was hyperplastic, and in areas showed many compound granular cells and pigment, but no inflammatory exudate was present. This extensive vascular disease had led to multiple tiny sclerotic plaques, at times wedge-shaped, involving nearly the surface of the cortex, again extending various distances into or through it. These tiny secondary foci were not confined to the cortex, but occurred less frequently in the basal ganglia and in the intervening white matter, taking the form of lacunar atrophies.

SOME TYPES OF CEREBRAL ARTERIO-SCLEROSIS

By C. I. Lambert, M.D.

The speaker stated that a critical analysis of the disorders accompanying senile and arterio-sclerotic changes enabled one to make certain clinico-anatomical groupings with considerable precision. The simple senile disorders might be separated from the essentially arterio-sclerotic group of cases on the basis of fairly distinct clinical and anatomical features, admitting, however, that the one might be superimposed on the

other. The arterio-sclerosis which might be present in senile dementia probably played an insignificant rôle in the general involutional process. The essentially arterio-sclerotic disorders might be considered in their incipency as well as in the subsequent development, the latter on the basis of symptom-complexes presented, identifying the individual or composite symptoms as far as possible with a particular cerebral vessel or system of vessels. This plan had proved feasible and seemed desirable. Advantage had been taken of the normal blood supply of the brain, especially with reference to the distribution of vessels and their relative vulnerability.

Under the incipient type of arterio-sclerotic disorders were to be included those cases which showed general symptoms introductory to arterio-sclerotic decadence. It was fairly well characterized by sleeplessness, restlessness, headaches and dizziness, mental fatigueability, physical exhaustibility, abnormal irritability, palpitation of the heart and increased blood pressure. This stage was comparatively common in general practice, relatively rare in state hospital life, but retrospective evidence of it was found early in many of those cases which later developed focal arterio-sclerotic disorders. In the brains of these individuals there might be found little evidence of arterio-sclerotic change early, but it might be introductory to the severer grades of arterio-sclerosis.

Taking up the arterio-sclerotic disorders themselves, the author found that the larger basal trunks either by direct obliteration or by tortuosities or aneurisms, pressing upon the contiguous structures, might give rise to the various neurological symptoms. He next referred to the primary cerebellar and cerebral branch disorders, and to the symptom-complexes arising from occlusion or obliteration of the main cerebral vessels. It was of interest to bear in mind the variations in the minor branching of these vessels, and the possible limited lesions which might arise as the result of their obliteration. This was especially of value in the left hemisphere, where a limited lesion in clinically well observed cases might be of much value in the solution of controversial points.

A series of cases of considerable interest had to do with the terminal branches of distribution, *i. e.*, the medullary vessels supplying the marrow and the short cortical vessels supplying the gray cortex. These two systems of vessels might be more or less independently affected, and give rise to symptom complexes more or less clinically recognizable. Broadly defined, the medullary vessel disorder was characterized by an insidious onset with headache, vertigo, loss of memory, alterations in moods and general mental reduction. Light or severe apoplectiform or occasional epileptiform attacks distinguished these cases. These might be transitory, but often left residual defect symptoms, such as asymbolias, actual speech defects of a slow, slurring, syllabic, dragging character, various aphasic disorders, visual defects, pupillary disturbances and ocular palsies. Motor and sensory impairments might occur, both of a subjective and objective nature. The extent and character of the defect symptoms depended upon the multiplicity, distribution and size of the lesion. Focal symptoms often represented isolated limited defects, and their study bespoke a variety of interesting problems.

Dr. J. Ramsay Hunt said he had met with two cases of arterio-sclerosis in which the clinical symptoms were such as to lead to an exploratory operation for a supposed tumor cerebri and the location of the lesion in both cases was rather surprising. One would naturally think

that in a case where the symptoms of tumor were simulated by arterio-sclerosis, the lesion would involve the cortical vessels and arterioles, but in the cases he had in mind they were in the central perforating vessels coming off from the middle cerebral artery. In one of the cases the lesion was an arterio-sclerotic plaque situated on the upper portion of the circumference of the middle cerebral which had gradually extended, nipping off one after another the ascending vessels in the anterior perforated space, which pass to the basal ganglia. The symptoms in this instance were so suggestive of tumor that even in the absence of optic neuritis an exploratory operation was performed.

In the other case there was arterio-sclerosis with obliteration of the central perforating arterioles in the basal ganglia and capsular region, although the vessels of the circle of Willis showed little or no involvement and the main trunks were free from occlusive lesions. In this case there was a low grade of optic neuritis, with a progressively developing hemiplegia, which, together with the general symptoms of tumor, led to the exploratory operation. Both of these cases were seen by a number of competent neurologists, who agreed in the probable diagnosis of tumor and the advisability of surgical exploration.

A PRELIMINARY REPORT UPON THE TREATMENT OF THE SPASTICITY OF CEREBRAL DIPLEGIA BY SECTION OF THE POSTERIOR SPINAL NERVE ROOTS

By L. Pierce Clark, M.D., and Alfred S. Taylor, M.D.

Dr. Clark said it was generally admitted that the degree of muscle tone in an extremity was determined by the sensory impressions from the parts, and especially from the muscles. Tonic spasm might be regarded as an augmented degree of this state, due to various causes. The spasticities of cerebral diplegias were due to the greatly diminished control of the cerebral centers, allowing an unrestrained play of the lower reflex arc, resulting in a spastic state. Many operations had been undertaken to restore the proper balance in this lower reflex arc, and thus overcome the spasticities of cerebral diplegics. Early operations on the superior motor system, such as Cushing and others had recently practiced, had been partly successful, but these attempts at removal of brain clots had not succeeded in restoring that degree of cerebral control sufficient to avoid the spastic paraplegias of later life. The speaker also referred to the many admirable and helpful methods of tendon, muscle and nerve adjustments which were practiced by orthopedists and surgeons in this field, but their results had still left us searching for other methods of treating spasticities.

Dr. Clark said he had found but one worker in this field of neurological surgery, namely, Foerster, who had made any systematic attempt to reduce the sensory influx from the spastic parts. As spinal anesthesia induced in the cerebral diplegias had been found to cause a temporary lessened spasm in the spastic parts, it was reasonable to suppose that a permanent removal of the excess of sensory influx might induce flaccidity, or at least a lessened spasm, and thus permit an advantageous adjustment of the whole mechanism. It was fair to suppose that the sensory supply of the spastic muscles was approximately from those nerves which also supplied the zonal areas of the skin immediately overlying the muscles

involved, and that the best point to attack the sensory elements would be at the sensory roots in the spinal canal, dorsad to their ganglion. He therefore suggested to Dr. Taylor to operate at that point, and the operation was done on a boy ten years old, whose history was negative aside from a cerebral diplegia following a severe attack of scarlet fever at eleven months of age. In this case, following the paralysis, the spastic gait slowly developed, and when he was three years old he was pronounced an incurable spastic paraplegic in several of the city clinics.

Examination before operation showed the usual type of spastic diplegia syndrome—exaggerated knee jerks, ankle clonus, Babinski, and a tendency to “crossed legged progression.” The boy, however, walked without assistance, but with great difficulty, with arms extended. He was operated on by Dr. Taylor on August 23, 1909, the operation consisting of section of the posterior roots of the last dorsal and all the lumbar segments on the left side, six in all. There was no discernible sensory impairment following the operation. The neurological examination one week after the operation showed a reduced spasticity of the left leg, a great reduction of the left knee jerk, absence of ankle clonus and an imperfect production of the Babinski and Oppenheim reflex. Crossed leg progression was succeeded by quite a “straddle gait.” The boy’s gait had steadily improved since the operation. The right leg remained unchanged. In conclusion, the authors called attention to the possible value of this method of treatment for all kinds of spinal and cerebral spasticities. They also referred to the very little or no loss of sensibility after section of several posterior spinal roots, and the very considerable possibility of operative interference on extensive areas of the spinal cord by this method.

Dr. Alfred S. Taylor said the operation he had done in this case, as well as in a previous case about a year ago, was that of unilateral laminectomy. After considerable experimentation on the cadaver he had found that the elimination of the laminæ on one side would give him sufficient room to reach the nerve roots, and that by preserving the spinous processes and the laminæ on the opposite side, one could scarcely tell afterwards that any operation on the spine had been done. In the cervical region, this operation of unilateral laminectomy gave him about half an inch free space; this was less lower down, and in the lumbar region it was about a quarter of an inch. After entering the spinal canal the dura was opened a little to one side of the median line and the cord exposed. This gave a direct exposure of the posterior roots on one side, and if it was found necessary to divide the roots on the opposite side, ready access could be gained to them by rotating the cord. In the case that had been shown and described by Dr. Clark, the laminæ and spinous processes of the left last dorsal and all the lumbar vertebræ were removed, and about one inch of each of the corresponding posterior nerve roots was excised and turned over to Dr. E. G. Zabriskie for examination. In this case the lumbar enlargement of the cord was exposed with the beginning of the cauda equina. The posterior roots of the twelfth dorsal and five lumbar nerves on the left side were divided, so as to leave the right side as a control, and also to note if there were any trophic disturbances to contraindicate a more extensive resection of the posterior roots.

The nerve roots on the right side of the lumbar enlargement were easily exposed to the spectators by rotating it through about 90 degrees. The roots could have been resected easily. The wound in the dura, as well as the external wound, were closed completely, without drainage, and

primary union was obtained throughout. In connection with this case, Dr. Taylor showed a number of instruments which he had devised for the purpose of facilitating the technique of the operation.

Dr. B. Sachs said that while he had been much interested in the presentation of this subject by Drs. Clark and Taylor, he confessed that the theory underlying the operation did not particularly appeal to him. After a diplegia had been established for any length of time, he could not see how the sensory impulses should be responsible for the persistence of the contractures, although they might be responsible for their origin. In the chronic cases, the continuation of this sensory excitement could not be a matter of very great importance. Still, the results that had followed these operations were certainly sufficiently striking and encouraging to warrant further investigation along these lines. A curious feature of the cases was that there had been no sensory disturbances reported after these extensive operations on the posterior nerve roots. This was contrary to the theories long held on that point. Personally, Dr. Sachs said, he was a little undecided as to whether the ultimate results of this operative method of treating these cases would be better than could be secured by radical orthopedic measures, such as tendon-cutting. A larger experience would be necessary to decide that point.

Dr. Edward D. Fisher thought that any attempt at moving the legs in these cases caused a good deal of cerebral irritability, and therefore section of these posterior nerve roots gave more or less cortical rest. In connection with this subject, the speaker referred to the paper of Dr. John J. Nutt, and also one by Drs. Schwab and Allison on "The Surgical Treatment of Athetosis and Spasticities by Muscle Group Isolation," which was presented at the last meeting of the American Neurological Association. In one of Dr. Nutt's cases, which was treated by resection of the nerves, the patient was very irritable prior to the operation, while subsequent to it she showed marked cerebral quietude. In that particular case, which Dr. Fisher saw, there was paralysis, especially of the extensor leg muscles, and the idea was to educate those muscles. The method described by Dr. Schwab was to inject alcohol into the nerve.

In severe cases of cerebral diplegia, the method described by Dr. Taylor is worthy of trial. In those cases we had not only cerebral irritation from the impulse of the child to make certain movements, but also from the actual movements that were made.

Dr. I. Strauss offered the suggestion that the case shown by Drs. Clark and Taylor was not one of cerebral diplegia. According to the boy's history he had an attack of scarlet fever, followed by flaccid paralysis, which was perhaps the result of a myelitic lesion in the cord with symptoms now due to secondary sclerosis, just as in Erb's case of syphilis of the spine. This boy appeared to be too intelligent to have had such a lesion of the brain at that time. In addition to the cases reported by Foerster two years ago, to which Dr. Clark referred, he very recently reported a number of additional cases, not only of cerebral diplegia, but also a case of hemiplegia and of multiple sclerosis. In these cases, which were operated on for Foerster by Kuttner, and reported in the last number of *Mittheilungen aus den Grenzgebieten* the results have been remarkable in that the patients, some of whom were bed-ridden, have been able to get about. In two cases reported from the Breslau Surgical Society in which the lesion was in the upper cervical cord, the result of resection of the posterior roots was an excellent one. In the case shown by Drs. Clark

and Taylor, the remarkable feature was that the cutting of the posterior roots had not produced anesthesia. The thoroughness of the operation could not be questioned, as sections of the nerves had actually been removed and examined. Experimentally, it had been found by Sherrington that cutting three posterior nerve roots in apes produced anesthesia, and to avoid this, Foerster advised against cutting any three successive posterior roots. In his cases, only alternate roots were cut, occasionally two in succession, but never three. To this he ascribed the fact that in none of his cases had the operation been followed by anesthesia or any trophic disturbance, nor had there been any ataxia. He found that the division of one or two sensory roots was sufficient to quiet the affected muscles. In one case of tabes the operation was successfully done for the relief of long-continued gastric crisis. The posterior roots of the ninth to eleventh dorsal nerves were cut.

Dr. Terriberry said that in cases of cerebral diplegia in children whose mentality was not seriously impaired, it had been his experience not infrequently to see the spastic condition improve as the patients grew older. The operation described by Drs. Clark and Taylor for the improvement of these cases seemed practicable, and he hoped that further experimentation would establish its true value.

Dr. Clark, in closing, said that this method of treatment was still in its experimental stage, and that the studies in connection with it were still going on. In the case they had shown, all sorts of orthopedic operations had been tried since the boy was three years of age, and with little or no resulting benefit. The orthopedic appliances, however, would still be used to supplement this special method of treatment. Dr. Clark said he could not agree with Dr. Terriberry that these spastic conditions were inclined to improve as the patients grew older. According to his own experience, the deformities seemed to progress.

Dr. Taylor said that while there was still a good deal of spasticity present in this case, the fact should be borne in mind that this was the first case and that only a small number of the nerves had been divided. It was thought advisable, for obvious reasons, to limit themselves to a small area, so that the exact effect of the operation could be determined. In this case the operation could only be regarded as an incomplete or partial one, and the results obtained certainly justified the hope that much more could be achieved by a radical procedure.

FURTHER CONTRIBUTION TO THE STUDY OF POLIO-MYELITIS ACUTA

By I. Strauss, M.D., and Dr. Huntoon

The results of inoculation experiments on animals were described, and the following conclusions offered: (1) That poliomyelitis acuta is an infectious disease; (2) that the virus is probably non-bacterial. The disease simulates rabies histologically; (3) that of the animals experimented upon, the monkey alone is susceptible, but attenuates the virus (4) that after the disease is clinically defined, *i. e.*, by the presence of paralysis, the virus is probably not in the blood; (5) that the cerebro-spinal fluid does not always contain the virus; (6) that when the disease is recognizable, the virus is present only in the cord. This emphasizes the hopelessness of curative treatment.

Dr. Terriberry said the paper of Drs. Strauss and Huntoon had emphasized the fact that thus far nothing of a positive bacteriological character had been discovered in the study of acute poliomyelitis in or about the central nervous system, and further, that the alimentary canal of cases examined post-mortem, gave evidence of decided pathological changes. Since the first of September of the present year, Dr. Terriberry said, he had seen at least fifty cases of acute poliomyelitis in this city, and he had been particularly interested in inquiring into the condition of the bowels of these patients. In all of the last thirty cases in which only a careful inquiry was made, there was a distinct history of blocking of the bowels for a day or more prior to the onset of the symptoms, and diarrhea, if present, which was infrequent was secondary. Another interesting point was that the stools for the first two or three days after the onset of the disease or indeed until the bowels were thoroughly cleansed were exceedingly offensive and contained many scybala.

These facts seem to warrant a suspicion, at least, that a toxin having the alimentary canal for its source is the cause of acute anterior poliomyelitis. Of the origin and nature of this toxin we hope for enlightenment.

Dr. Smith Ely Jelliffe asked Dr. Strauss if the fact that was fairly well known to veterinarians that a large number of the different monkey tribes were specially liable to flaccid paralysis would have any direct bearing on the facts that he had presented? In marmosets particularly and three or four other species, flaccid paralyzes, especially in the lower extremities, were common. He asked the reader of the paper whether he knew anything of the pathology of this flaccid paralysis and whether it would have any bearing on the question of the etiology of poliomyelitis, and whether it was not somewhat premature to draw the conclusions in view of the special vulnerability of the primate spinal cord.

Dr. Strauss, in reply to Dr. Jelliffe, said he did not know that certain of the monkey tribes, marmosets, especially, were subject to flaccid paralysis of this type. He knew it was claimed that certain domestic animals, such as goats and horses, were subject to poliomyelitis, especially during the period of an epidemic, and he had heard of one case occurring in a horse this last August. If we had to deal with a monkey that was suffering from flaccid paralysis, and with a lesion of the spine similar to those met with in poliomyelitis in human beings, we would have to accept the fact that that monkey was suffering from poliomyelitis. But both Landsteiner and Pepper and as well as Dr. Huntoon and himself only found the lesions and paralysis in those monkeys which were injected with cord emulsions while other monkeys in the laboratory were unaffected.

PHILADELPHIA NEUROLOGICAL SOCIETY

October 22, 1909

The President, DR. T. H. WEISENBURG, in the Chair

A CASE OF TABES WITH UNILATERAL FOOT DROP

By S. D. Ingham, M.D.

The patient, a man of forty-two years, gives a history of a primary syphilitic lesion several years ago, and the typical symptoms of tabes have developed during the past two years. During the past year there have developed symptoms of soreness and weakness in the right leg, and for nine months he has had complete foot drop on that side. The left leg is not affected. Measurement of the calf shows that the circumference of the right leg is about three quarters of an inch smaller than the left. Excepting the ocular muscles, peripheral paralyses in tabes are not very common. Of the cases reported, some have been attributed to neuritis, others to involvement of the anterior horns of the spinal cord. From the pain and soreness present, and from the absence of fibrillary twitching, this case may be considered one of peripheral nerve involvement rather than of the anterior horn.

DISSOCIATION OF SENSATION IN THE FACE OF THE TYPE
INVERSE TO THAT IN SYRINGOMYELIA: THE RECOGNITION OF CONTACT IN THE EYEBALL THROUGH THE FIBERS OF PAIN

By William G. Spiller, M.D.

The case reported was one in which temperature and pain sensations were lost on the entire right side of the body, including the face and limbs, while tactile sensation was preserved in these parts, and passive movements were recognized in the right hand. Tactile sensation, and in a large measure pressure sensation, were lost in the left side of the face in the region innervated by the trigeminal nerve; while pain and temperature sensations were entirely normal in these parts, except that heat was not felt so well over the left forehead. Contact with the right eyeball was scarcely recognized, if at all, whereas contact was promptly recognized in the left eyeball. The symptoms mentioned with other symptoms made a diagnosis of a lesion of the left tegmentum of the pons probable, and this lesion was supposed to be multiple sclerosis. Contact with the eyeball was recognized on the side in which pain sensation was preserved, even though tactile sensation was lost; it was very imperfectly recognized, if at all, on the side in which tactile sensation was preserved but pain sensation was lost.

Dr. F. X. Dercum said it would be difficult to devise an explanation more in accordance with our knowledge of anatomical structure than that formulated by Dr. Spiller. Dr. Spiller spoke of the explosive utterance, and this is in keeping with the view that we have here to deal with a sclerotic process, possibly a multiple sclerosis.

Dr. Charles K. Mills said that when he saw this patient in 1907 all the symptoms had not developed. He was examined by him several times

for station, gait, etc. His impression was that some of the symptoms which had been described by Dr. Spiller were not then present. He had no doubt that the focal diagnosis he had given is correct. He was not sure, however, that the case was not one of tumor, especially a glioma. It is well known that in gliomatous growths invading nervous tissues functioning may take place through the lesion. Dr. Spiller's account of this patient is an instructive analysis of a most interesting case.

Dr. Williams said the only difficulty he saw was in regard to deafness. Why should not the number of fibers which had passed to the right side present the degree of deafness in the right side which is present in the left? Would it not appear that the lesion has extended downward also, particularly as it has affected the fibers and nuclei of the sixth and seventh nerves?

A CASE OF CEREBRAL HEMORRHAGE SIMULATING CEREBRO-SPINAL MENINGITIS

By J. Hendrie Lloyd, M.D.

The case had interested Dr. Lloyd very much, both from a clinical and a pathological standpoint. The patient was a lady sixty years of age who had been for a good many years a private patient of his. Last May, after a day or two of very strenuous house-cleaning, she was taken ill in the middle of the night and Dr. Lloyd was sent for. He found her in bed complaining of very severe headache, and she had a little fever. She had made her own diagnosis that she had taken cold. There was nothing to indicate a serious brain trouble, and Dr. Lloyd was disposed to take her at her word. Although at the end of thirty-six hours she had improved, she did not get well. She continued in bed with very severe pain at the nape of the neck. In two or three days she had distinct retraction of the head. The course of fever was irregular and the whole appearance of the case became rather puzzling. At the end of the fourth day the patient was a little delirious. Dr. Lloyd had begun to suspect some meningeal trouble, and had her transferred to the Methodist Hospital at about the fifth day. By that time she was still more delirious and the appearance of the case was still more distinctly one of meningeal irritation. There was marked retraction of the head and persistent severe pain at the back of the neck. By the time she was taken into the Methodist Hospital the appearance was so much like a meningeal trouble that several physicians who saw her believed the condition was cerebro-spinal meningitis. There began to be some rigidity of the legs and curious delirious phases. She would lie in a semiconscious condition for a day or two and then arouse and seem better. There was nothing to indicate typhoid fever infection. In the second week Dr. Lloyd had lumbar puncture made by Dr. Hammond, which brought out a very bright blood-stained cerebro-spinal fluid. The blood was thoroughly mixed with the cerebro-spinal fluid as is seen when it is of meningeal origin. Examination of the fluid was entirely negative so far as bacterial infection was concerned. The disease continued with the meningeal symptoms persisting, and at the end of a few days another lumbar puncture was made. The Board of Health was notified in the meantime that a case of rather obscure meningeal symptoms was in the hospital. The physician from the Health Board went to the hospital and pronounced it a case

of cerebro-spinal meningitis of irregular type. The patient never had a hemiplegia, and no localized paralysis of any kind. There was some optic neuritis reported by Dr. Turner. In the third week there was contraction of both legs, but there was absence of knee-jerk. The second examination of the spinal fluid also gave negative results. Dr. Lloyd began to be very doubtful about the diagnosis of cerebro-spinal meningitis, especially because the bacterial tests were negative. He did say at one time that the symptoms might be indicative of meningeal hemorrhage. The third lumbar puncture, made at the end of another few days, did not show red fluid but fluid of a bright orange color. It was evidently cerebro-spinal fluid no longer stained with free blood, but with the coloring matter of the blood. When the case was at its height, in order that the patient should have every chance, she was given 20 c.c. of Flexner's anti-meningeal serum. She immediately got considerably better, though Dr. Lloyd did not see why she did in view of what afterwards was found at the autopsy. The case terminated rather abruptly one night about the end of the fifth week, the woman dying unexpectedly.

The post-mortem examination showed an extensive cerebral hemorrhage. There was clotted blood in both lateral ventricles, more in the right than in the left. The blood extended through the aqueduct of Sylvius, filled the fourth ventricle, then emerged at the foramen of Majendie, and spread beneath the membranes over the under surface of the cerebellum. It also extended as a rather thick layer the whole length of the spinal cord to the cauda equina. The special interest in the case lies in the fact that such an extensive hemorrhage, originating within the brain, should have caused symptoms which were so largely meningeal. The brain and cord were exhibited.

Dr. Allen said he was specially interested in the origin of the hemorrhage. He reported a number of cases a few years ago of hemorrhage in the posterior part of the thalamus, showing the same symptom-complex. He, however, had the cases after death and did not know what the cerebrospinal fluid would have shown. It looked to him in this case reported by Dr. Lloyd as though the posterior part of the thalamus had been involved on one side, possibly by the rupture of the blood vessels in that part.

Dr. D. J. McCarthy said the history of the case suggests an acute infection with the production of symptoms. The condition of hemorrhagic meningitis localized at the base of the brain accompanying the spinal meningitis occurred in a case which he studied and was caused by acute cerebro-spinal tuberculosis in an acute tuberculous infection. Not a few of the cases of cerebro-spinal meningitis in the adult have their determination in some bacterial infection. It would be interesting to know what the rest of the autopsy showed and to know whether there were any evidence of acute infection and if so the nature of it.

Dr. Lloyd said there were interesting features in this case which he had not attempted to go into in detail. He did not search very extensively for the origin of the hemorrhage. He thought one of the hardest things to find is the point of bleeding in cases of cerebral hemorrhage. It all reads very nicely in the books, but at the post-mortem examination it is very difficult to find the point of hemorrhage, and the specimen is apt to be spoiled in the attempt. In this case the bleeding was probably from the choroid plexus. He did not see how it could be determined after death whether or not the blood was venous in origin.

Another interesting point is the question how a patient could have continued for a whole month with the fluctuating symptoms which this patient had without hemiplegia, with extensive hemorrhage in both ventricles extending also into the fourth ventricle and down the whole length of the cord. Dr. Lloyd did not think the hemorrhage came from the optic thalamus as suggested by Dr. Allen. The patient did not have the thalamus syndrome, and at autopsy the thalamus was found intact. The possibility of acute infection with hemorrhage as suggested by Dr. McCarthy, is worth thinking of, but Dr. Lloyd was inclined to doubt it. Although the progress of the case was much like that of cerebro-spinal meningitis, there was nothing more than hemorrhage. If there had been acute infection the three lumbar punctures, with bacteriological examinations made in several institutions, ought to have demonstrated it. The case shows the value of lumbar puncture and bacterial examination, because negative evidence is often as valuable as positive evidence.

Dr. William H. Hudson, of Atlanta, Ga. (by invitation), demonstrated a new method and instruments for opening the skull.

Dr. Charles H. Frazier said he had been very greatly interested in the demonstration and he regarded the device which Dr. Hudson has placed in the hands of surgeons as one of the greatest contributions to our armamentarium for many years. He had used a set of the braces and drills with the greatest satisfaction, and found them absolutely safe. The work can be done rapidly and these instruments are bound to take the place of the ordinary trephine. It is possible to make 10 or 12 openings in the skull of the size made with the ordinary trephine with the instrument of Dr. Hudson in the time required to make one or two by the old fashioned trephine.

Dr. Frazier thought what Dr. Hudson had said about the ordinary spiral osteotome is perfectly true. It is not for general use. A good deal of experience is required and the average man fails. That has been the experience of two or three people who have ordered a set. Dr. Gibson of New York and Mr. Balance ordered sets and have been very much dissatisfied with them. This shows that the instruments are not to be used except by people with a good deal of experience. The instrument of Dr. Hudson cuts quite as narrowly, if not more so, than the ordinary spiral osteotome, and perhaps even more rapidly.

Dr. F. X. Dercum said in justice to the French surgeons Doyen's work must not be regarded as representative. That which interested him especially in Dr. Hudson's instrument was the elipsoid edge. He could not understand how it became arrested immediately after the internal table was opened, until he comprehended this feature of the burr. One axis being longer than the other, there must necessarily be a "binding" the moment the skull is penetrated.

Dr. John B. Carnett was most favorably impressed with the simplicity of the instruments shown and compared with those more complicated ones with which we are familiar they have many advantages. The apparatus which goes with many of the others weighs sometimes two or three hundred pounds, and it is not always convenient to carry it about. There is nothing in these to get out of order. They are absolutely safe and the speed with which the skull can be opened is a very important factor. The instruments look as if they had strength, which many of them lack. He thought they were sure to become the instruments of choice with the most expert who now have the most complicated and elaborate instruments available.

Dr. S. D. W. Ludlum and Dr. E. Corson White reported their experience with the Wassermann reaction.

Dr. J. Hendrie Lloyd said he had watched with much interest the progress of the work of Drs. Ludlam and White in the wards of Blockley. There are some problems which he hoped will yet be cleared up. We want to know the value of the negative results, and whether such results indicate that the patient has not had syphilis, or, on the other hand, whether they may indicate that he has had anti-syphilitic treatment. Mercurial inunction is supposed to modify the test; and there are also various periods of latency to be accounted for, just as in trypanosome infection. Such questions must be worked out by the scientific method. It is needless to say that a reliable test would be of the greatest clinical value. Dr. Lloyd had seen a patient with obscure cerebral symptoms suggestive of syphilis. The man denied that he ever had the disease. If we could demonstrate a positive reaction in cases like that we should be placed in a position of great advantage.

Periscope

Revue Neurologique

(Vol. XVII, No. 12)

1. Contribution to Study of the Cerebro-spinal Fluid in Tuberculous Meningitis. (An effort to establish a chemical formula.) W. MESTREZAT AND E. GAUJOUX.

2. The Lesions in the Spinal Nerve Roots in Meningitis. M. J. TINEL.

1. *Study of Cerebro-spinal Fluid*.—The characteristic chemical content of the cerebro-spinal fluid in tuberculous meningitis is: Some elevation of the amount of albumin; small proportion of sugar; amount of extractives lowered or normal; exaggerated permeability to nitrates; freezing point lowered and lessened amount of chloride. There is a bibliography of researches in the chemistry of the cerebro-spinal fluid in meningitis.

2. *Root Lesions in Meningitis*.—The nerve roots are accompanied by processes from the dura and arachnoid which become fused with the nerve sheath. These extensions of the arachnoid form cul-de-sacs in direct communication with the sub-arachnoid space. Solid particles in the cerebro-spinal fluid tend to collect in these spaces about the nerve roots. This is explained by Nageotte on the grounds that the nerve roots and their membranes are the outlets in the circulation of the cerebro-spinal fluid. In meningitis the leucocytes tend to collect in these spaces and produce changes by direct contact with the nerve roots inasmuch as the leucocytes are the vehicles of the toxin. The posterior roots are more affected than the anterior because the anterior are more compact.

(Vol. XVII, No. 13)

1. A Case of a Singular Family Neurosis (Myoclonus) with Glycosuria and Epileptic Crises. E. LENOBLE AND E. ANBINEAU.
2. A Case of Parkinson's Disease with Pseudo-bulbar and Pseudo-ophthalmoplegic Syndrome. A. JANISCHEWSKY.

1. *Myoclonus and Glycosuria*.—A brother of the patient had an analogous affection and died. Another brother had a "myoclonous nystagmus" and a sister had epileptic attacks. The patient had headache and polydipsia at three years of age and at the age of fourteen showed stigmata of degeneration, exaggeration of reflexes, rotary vertigo with tremor of the hands and fingers and epileptic attacks. At the age of seventeen a permanent glycosuria appeared with persistence or exaggeration of all the preceding signs. Death was due to pulmonary tuberculosis at the age of nineteen years, and necropsy showed no alterations either macroscopic or microscopic in the brain or spinal cord. There was a simple atrophy of both optic nerves. The brain weight was below normal.

2. *Parkinson's Disease*.—Symptoms of paralysis agitans with some difficulty in the voluntary movement of the face and tongue. He could not move the eyes voluntarily but he could fix the eyes on an object and

keep them there despite movement of the head, and he could follow the movement of an object with his eyes no matter how rapidly it was moved. The author regards these phenomena as due to a lesion somewhere between the primary or lower centers for ocular movements and the cerebral cortex. The difficulty in movement and rigidity in paralysis agitans is not due to a paralysis in the sense of difficulty in voluntary contraction but is rather due to difficulty in relaxing the antagonists.

(Vol. XVII, No. 14)

1. Progressive Spinal Muscular Atrophy, Syphilitic. PIERRE MERLE.
2. Traumatic Hemisection of the Spinal cord, Brown-Séquard's Syndrome. RAUZIER AND L. RIMBAUD.
3. A Case of Amaurotic Family Idiocy of Tay-Sachs Type. C. PARHON AND M. GOLDSTEIN.
4. Clinical Varieties of Primary Dementia (Dementia Præcox). LEVI-BIANCHINI.

1. *Progressive Muscular Atrophy*.—There was gradually developing simultaneous atrophy of all four extremities twenty-five years after a syphilitic infection. The biceps jerks, knee jerks and Achilles jerks were lost. There were no Babinski, no ataxia, no pain, no sensory changes and no trouble with the sphincters or sexual functions. There was a slight lymphocytosis of the cerebro-spinal fluid. Necropsy showed atrophy of the anterior horns of the spinal cord, slight thickening of the meninges, a slight infiltration of lymphocytes in the meninges and about the blood vessels and a capillary fibrosis in the spinal cord. There was no degeneration in the white matter.

2. *Traumatic Hemisection of the Spinal Cord*.—A clinical report of a case of stab wound of the spinal cord at the level of the sixth dorsal vertebra. There was at first complete paraplegia, later a Brown-Séquard paralysis. The study of the sensory dissociation confirms the views generally held as to the course of the sensory impulses in the spinal cord.

3. *Amaurotic Idiocy*.—A Hebrew child, aged fourteen months, was normal until the age of eight months and then began losing intelligence, stopped learning, movements became more difficult, the musculature flaccid and at the same time there was loss of vision. Ophthalmoscopic examination showed optic nerve atrophy and a spot of red at the location of the macula. The author calls attention to the occurrence of a large proportion of cases among Hebrews.

4. *Clinical Varieties of Primary Dementia*.—The author gives seven varieties: heboidophrenia or dementia heboidophrenic, dementia hebephrenic, dementia hebophreno-catatonic, dementia catatonic, dementia catatono-paranoid, dementia hebaphreno-paranoid and dementia paranoid.

(Vol. XVII, No. 15)

1. Contribution to the Histological Pathology of Multiple Sclerosis. G. MARINESCO AND J. MINEA.
2. Tuberculosis of Hypophysis with Diabetes Mellitus. M. LUCIEN AND J. PARISOT.
3. A New Procedure for Staining Neuroglia Cells and Fibers. J. L'HERMITTE.

1. *Histological Pathology of Multiple Sclerosis*.—The author reviews the histological pathology of multiple sclerosis as exposed in the liter-

ature. The methods of Bielschowsky and Cajal were used in examination of the nervous system in a case reported. There were found new formed fibers in the areas of sclerosis and some persistence of old axis cylinders. Where the sclerosis involved the gray matter, the nerve cells were very irregular in outline, generally swollen and the position of the neurofibrils modified. The author does not think that the persistence of axis cylinders in multiple sclerosis is an essential characteristic of the disease; it also occurs in other sclerosis of the spinal cord.

2. *Tuberculosis of the Hypophysis, with Diabetes Mellitus.*—Tuberculosis of the hypophysis occasionally occurs in connection with acromegaly and diabetes. Von Noorden has noted the frequent occurrence of this combination of symptoms. The patient reported, sixty-five years old, had polyuria, polydipsia, and polyphagia, with considerable emaciation. There was no furunculosis, no pruritus, nor other sign of diabetes. The specific gravity of the urine was 1022; glucose about five per cent. No symptoms of acromegaly. Autopsy showed tuberculosis of the hypophysis which did not entirely destroy it.

3. *Staining Method for Neuroglia.*—Fixed in formalin 10 per cent. three or four days. Sections should be cut then, but it is not necessary, as they can remain in 5 per cent. solution for a long time. Cut sections with the freezing microtome. Wash in water for a few minutes then in a saturated solution of sublimate for two hours, followed by a solution, of which the formula is: osmic acid 1 per cent., 3 gms., chromic acid 1 per cent., 35 gms., acetic acid 2 per cent., 7 gms., distilled water 55 gms; 12 hours. Sections are then washed in water and stained as follows: They are removed on cigarette papers and stained in 1 per cent. solution of Victoria blue, being slightly warmed until the solution steams. They are then passed through a Gram solution for differentiation and then through a mixture of equal parts of xylol and anilin oil. It is then possible to counterstain by a solution of eosin in absolute alcohol. Sections are then cleared in xylol and mounted in balsam.

(Vol. XVII, No. 16)

Contains the proceedings of the nineteenth Congress of Alienists and Neurologists, at Nantes, August 2-8, 1909.

The first report was, "The Fugues in Psychiatry," by Victor Parant; second report, "Mental Alienation in the Army from the Clinical and Medico-legal Point of View," by Granjux; third report, "On the Mental Alienation in the Army," by Rayneau; fourth report, "Chronic Chorea," by Sainton, with the additional communications, by Ballet and Laignel-Lavastine, on a case of chronic chorea, with autopsy, and by Andre Thomas on chorea of Sydenham as an organic disease, in which the author reports ten infants having Sydenham's chorea who presented signs of organic lesion in the nervous system. Further general communications comprised: "Destruction of the Cerebellum Without Cerebellar Symptoms," by Rousset and Giraud; "Flocculus and Vision," by Giraud and Genty; "Researches on the Reaction Time of the Knee Jerk," by Parisot; "Study of Respiratory Movements in Patients with Various Tremors," by Parisot; "The Pressure of the Cerebro-spinal Fluid in Man in Normal and Pathological Conditions," by Parisot; "Nervous Symptoms and Complications of Typhoid," by Porot; "The Sign of Jellinek (Pigmentation of the Skin) in the Syndrome of Basedow," by Sainton; "State of the Pupils in Basedow's Disease," by Sainton; "Hemianesthesia in Hys-

teria," by Terrien; "Researches on the Contents of Calcium in the Blood and Nerve Centers in Experimental Tetany Following Thyroparathyroidectomy," by Parhon and Dumitresco.

(Vol. XVII, No. 17)

1. Syndrome of Coagulation en masse, Yellow Color and Hemato-leucocytosis of the Cerebro-spinal Fluid. E. DERRIEN, W. MESTREZAT AND H. ROGER.
2. Latent Pupillary Inequality in Organic Diseases of the Nervous System. A. CANTONNET AND P. TOUCHARD.
3. Headache in Dementia Præcox. G. HALBERSTADT.

1. *Hæmorrhagic Meningitis*.—Clinically, the syndrome consists of a spastic paraplegia with sensory trouble and some impairment of the sphincters. The diagnosis was a subacute meningo-myelitis affecting particularly the periphery of the spinal cord. There was no antecedent tuberculosis or syphilis and the etiology is not known. The cerebro-spinal fluid was clear, of a golden yellow color and containing red blood cells and lymphocytes, but no leucocytes. The liquid solidified on standing a few minutes. The case improved. In similar cases coming to autopsy the meninges were found thickened and divided by adhesions into small sacs. The etiology is uncertain; in some cases tuberculous and in others syphilitic. Lumbar puncture is also of value in relieving the symptoms.

2. *Latent Pupillary Inequality*.—In some cases pupillary inequality may be demonstrated by the use of mydriatics when not present before.

3. *Headache in Dementia Præcox*.—Headache is a very frequent symptom in dementia præcox. It frequently occurs early in the disease and may be either slight or severe. The cause of the symptom is unknown "but the clinical value of this sign appears undeniable."

CAMP (Ann Arbor, Mich.)

Brain

(Vol. 32, 1909. Part 126)

1. On the Structure and Functional Relations of the Optic Thalamus. ERNEST SACHS.
2. Myotonia Atrophica. F. E. BATTEN AND H. P. GIBB.
3. Note on the Movements of the Tongue from Stimulation of the Twelfth Nucleus, Root and Nerve. A. T. MUSSEN.
4. The Occurrence of Remissions and Recovery in Tuberculous Meningitis. A. E. MARTIN.

1. *Optic Thalamus*.—This is an imposing and extremely elaborate piece of work of considerable importance. One finds it difficult to follow by reason of its magnitude and a certain lack of a systematic presentation. The space that it deserves cannot be given to it here, and one can only present the summary of the author's extremely valuable paper. It is of interest to note that Sachs reduces the number of nuclei to the original Burdach scheme of 7, while Cecile Vogt, in a recent work on the thalamus, increases the number to 44. Sachs admits the anterior, median, lateral, ventral, center median, arcuate and pulvinar nuclei. His summary is as follows:

(1) The hypothalamus is essentially distinct from the thalamus. (2) The hypothalamus is closely connected with the globus pallidus. (3) The thalamus must be regarded as consisting of an inner and outer division.

of which the inner includes the nucleus anterior and nucleus medius. (4) The inner division is in association with the nucleus caudatus and with the rhinencephalon. (5) The outer division is the end station of the fillet and of the superior cerebellar peduncle. It is closely connected with the Rolandic region of the pallium. (6) From the results of excitation experiments, as well as the anatomical facts deduced from very localized lesions, the inner and outer divisions of the thalamus appear to be in the main relatively independent organizations. (7) The precentral especially and postcentral pallium (*Macacus rhesus*) and the excito-motor area in the cat are connected by pyramidal fibers and collaterals with the middle and ventral thirds of the nucleus lateralis. (8) The temporal pallium (cat) is connected by projection fibers and collaterals with the postero-ventral region of the nucleus lateralis, the corpus geniculatum mediale and the pons varolii. (9) The thalami-cortical fibers connecting the nucleus lateralis with the pallium are arranged dorso-ventrally, so that those for the representation of the face are ventral to those for the limbs. (10) The general direction of the large majority of axones, whether originating in a thalamic nucleus or passing through the thalamus, is outwards and dorsalwards. (11) The precentral pallial area for the representation of the movements of the limbs is not connected by pallio-tectal fibers with the colliculi.

The work should be read in the original form, as many of the results seen in the numerous illustrations are extremely striking, although perhaps little new is added to our information.

2. *Myotonia Atrophica*.—Muscular atrophy of a peculiar distribution with slow relaxation of muscles after contraction is the general definition given by the authors to this disorder. They adopt Rossolimo's term for it, contrasting it with myotonia congenita, or Thomsen's disease. Five case histories are given, and the authors report having found 29 recorded cases in literature, summaries of which are given in an appendix.

3. *Tongue Movements*.—Stimulation of the twelfth nucleus causes the following movements: The tongue was protruded to the opposite side (right); the tongue was curled upwards and over to the right canine tooth. But the most unexpected reaction was a strong protrusion of the tongue from the mouth on the left side. When the left twelfth root in the medulla was stimulated, similar movements were produced. The tongue was curled upwards and to the right or opposite canine tooth, while stimulation of other fibers caused the tongue to protrude from the angle of the mouth *on the same (left) side*. The most frequent reaction on stimulating the (left) twelfth nerve in the neck was *a strong protrusion of the tongue out of the mouth on the same side*. Other reactions were: protrusion with the tip of the tongue strongly to the right or opposite side, and curling up of the tip, now to the right and at other times to the left.

The author further shows that when one-half of the tongue is paralyzed from affection of the nucleus, root, or nerve, the following symptoms are observed: Inability to touch the teeth, the gums, or to protrude the tongue into the cheek of the paralyzed side, while there is perfect freedom of movement to the sound side, the tongue being easily protruded into the cheek of this side and the teeth and gums being readily touched; in advanced cases secondary atrophic changes in the paralyzed half may, however, greatly interfere with the movements of the sound half.

4. *Tuberculous Meningitis*.—This is an interesting and valuable critical

review of some sixty articles on the subject, in which the author reaches the following conclusions:

(1) That undoubtedly long remissions and even recoveries do occur in tuberculous meningitis. (2) That recoveries are possibly more frequent than has been believed, since no fewer than twenty undoubted cases have been recorded since 1894, while other cases of recovery have been published in which the same definite proof of the nature of the disease has not been afforded, but some of which probably were true cases of tuberculous meningitis. (3) That in these cases either the resistance of the individual is so much greater than usual that the disease is checked early in its course, or the virulence of the bacilli is so much less than usual that the lesion in the meninges becomes localized and later undergoes a fibrous change. (4) That the lesion in the meninges may at a later period form the focus of a fresh infection which usually terminates fatally, and that consequently the prognosis in these cases must be guarded. (5) That no treatment up to the present has been discovered which has had any specific effect in promoting the favorable termination of the disease.

JELLIFFE.

Neurologisches Centralblatt

(Vol. 27, No. 17. September 1)

1. An Uncommon Case of Speech Disturbance as a Contribution to the Doctrine of the So-called Amnesic and Conduction Aphasia. F. HEINRICH.
2. Cortical Sensory Aphasia, with Preservation of Ability to Read. MEYER.
3. The Cortical Localization of Asymbolia. POGGIO.

1. (Continued article.)

2. *Cortical Sensory Aphasia*.—In a male of 34 years, having a cardiac lesion, there developed suddenly a condition of cortical sensory aphasia with unintelligible paraphasia. He understood nothing that was said to him, but was able to read aloud with fair accuracy, though not understandingly. He could copy fairly well, but he could not repeat nor write to dictation. The author states that most people in reading use the optic-acoustic-motor path, and that they understand what they read without bringing the motor part into activity. This case is an exception to this rule, and the order is changed to optic-motor-acoustic.

3. *Asymbolia*.—The case reported was that of a woman of 26 years, in whom Jacksonian epilepsy developed, beginning sometimes in the last three fingers of the left hand, at other times with conjugate deviation of the head and eyes to the left. There was no motor weakness nor sensory change, and particularly no astereognosis. By a surgical operation two cysticerci were removed, one from the hand area of the percentral, the other from the second frontal convolution. Twenty-two days after the operation the patient could describe the form and properties of objects placed in the left hand, although she could not name them. She named them immediately when they were placed in the right hand.

(Vol. 27, No. 18. September 16)

1. An Uncommon Case of Speech Disturbance, etc. F. HEINRICH. (Concluded.)

1. *Aphasia*.—The patient, a woman of 29 years, developed an aphasia rather suddenly, but without loss of consciousness or other notable symp-

toms. The aphasia consisted of almost complete loss of spontaneous speech and writing. She could sing correctly, and ability to understand spoken language and to read both silently and aloud, was preserved. Recovery was gradual and almost complete in six months. After discussing the literature of the subject, the author draws the following conclusions: (1) So far as the available post-mortem material justifies a conclusion, there is no typical localization for the clinical complex of conduction aphasia. (2) The so-called amnesic aphasia has no right to exist as an independent form of aphasia. (3) The symptoms of the so-called amnesic aphasia may accompany all forms of aphasia, as they are only the result of the diaschisis caused by the lesion. (4) The general decrease in excitability caused by the diaschisis may produce different pronounced disturbances, since there is variation in the strength of the stimuli necessary to excite the different centers.

(Vol. 27, No. 19. October 1)

1. The Pathological Anatomy of Multiple Sclerosis with Particular Reference to the Cerebral Cortex. G. OPPENHEIM.
2. The Silver Impregnation of Neurofibrils According to the Method of Bielschowsky. SCHÜTZ.
3. The Contraction of the Quadriceps in Vertigo After Cranial Injuries. BLOCH.

1. *Multiple Sclerosis*.—This article represents a careful histological study of four cases of multiple sclerosis. In three of the four cases there was plasma cell infiltration of an inflammatory character, which suggests an exogenous cause for this disease.

2. *Bielschowsky*.—In a short article the author discusses Bielschowsky's stain and attributes the occasional imperfect staining of the neurofibrils to the insufficient time used for impregnation, and gives his technic for using this stain.

3. *Vertigo*.—In cases of traumatic neurosis in which the principal symptoms are vertigo with or without a change of pulse rate on exertion, the author has observed an objective sign in about one-half of his cases, consisting of a contraction of the quadriceps femoris and elevation of the patellæ when the patient stands with the feet together and the eyes closed. This is caused by the uncertainty of equilibrium in the absence of marked swaying, and may be seen in early tabes before the appearance of Romberg's sign.

(Vol. 27, No. 20. October 16)

1. Concerning the Decrease or Absence of the Toe and Shortening Reflex (Verkürzungsreflex). GOLDFLAM.
2. The Situation of the Motor Nuclei in the Medulla in Phylogenetic and Teratologic Relations. ARIENS-KAPPERS AND VOGT.
3. Answer to the Paper of M. Kauffmann, "Concerning the Supposed Presence of Cholin in the Spinal Fluid." DONATH.
4. Answer to the Preceding Article. M. KAUFFMANN.

1. *Toe Reflex*.—The writer thinks that since the advent of Babinski's toe reflex, too little attention has been paid to the normal plantar reflex and its modifications. He divides the normal reflex obtained from irritation of the plantar surface into the toe reflex (plantar flexion of the four smaller toes) and the "Verkürzung" reflex, or flexion of the ankle, knee and hip due to the contraction of the various muscles of the leg and

thigh. These he considers to be separate reflexes, although they generally run parallel in their reactions. The diminution and absence of these reflexes occur at least as frequently as those of the abdominal and cremasteric reflexes in lesions of the central nervous system, and are of just as much diagnostic value. Interference with either the centripetal or centrifugal paths diminishes or abolishes these reflexes, and isolation of the lumbar cord (transverse lesion) markedly increases the shortening reflex. The toe reflex is a cortical reflex, Babinski's is exclusively spinal, and the shortening reflex is both cortical and spinal in character.

2. *Medullary Nuclei*.—The position of the motor nuclei of the brain stem has been studied in different species, and it was found that in the lower vertebrates, *e. g.*, fishes, the facial nucleus is in the dorsal part of the medulla and the sixth nucleus in the ventral; in birds this relation is partially changed, while in mammals the seventh nucleus is ventral and the sixth is dorsal. The conclusion is that the positions of the various nuclei are influenced or controlled by those tracts with which they are most intimately in relation, *e. g.*, the seventh with the pyramidal tract, the sixth with the posterior longitudinal bundle, etc.

B. (teratologic part) Vogt. In comparing the position of the seventh nucleus in a case of congenital absence of the motor tracts (anencephaly) and a case of microcephaly, with that of the normal, Vogt found that in the cases of defective development of the motor tracts the facial nucleus occupied a position more dorsal than normal, thus tending to prove the ontogenetic influence of the tract of its most intimate functional relationship upon the position of the motor nucleus.

3 and 4. *Cholin*.—These two articles represent a continuation of the controversy over the presence of cholin in the spinal fluid, and the value of the tests used to determine it.

(Vol. 27, No. 21. November 1)

1. Two Cases of Landry's Paralysis. SARBO.

2. Familial Infantile Cerebral Disease. MALAISÉ.

1. *Landry's Paralysis*.—The first case, a boy of 12 years, developed symptoms of involvement of the medulla and pons, followed by those of the upper, and later of the lower part of the spinal cord, dying on the fourth day from respiratory paralysis. No necropsy was performed. The second case was of the more common form, consisting of an ascending paralysis, ending in recovery. In this case there was transient atrophy of the muscles and reactions of degeneration. The author considers that both cases were due to spinal cord lesions, in opposition to the view still held by some that the disease is a form of multiple neuritis.

2. *Infantile Cerebral Disease*.—This article is a report of six cases of cerebral disease of gradual development, occurring in a family of nine children, of parents who were blood relatives, but apparently normal and with negative family history. The children affected all presented an almost uniform clinical history, viz., during the second or third year occurred a febrile condition lasting for a few days, followed within from a few months to a year and a half by a gradually developing paraplegia with spasticity. The arms were affected about a year later and finally complete diplegia developed with contractures of the legs, athetosis of the arms, bulbar symptoms and imbecility. One case developed only to a slight degree and then recovered, leaving only Babinski's and Oppenheim's signs as results. Two cases died. Two showed hypoplasia and one hyperplasia of the thyroid gland.

(Vol. 27, No. 22. November 16)

1. Procreation During Intoxication and its Injurious Results in the Offspring. P. NÄCKE.
2. Etiology of Epilepsy. BRATZ.
3. Disease of the Nervous System Caused by Protective Inoculations Against Rabies. W. PFEILSCHMIDT.
4. Acute Syphilitic Poliomyelitis. PREOBRASCHENSKI.

1. *Alcohol and Progeny*.—While the author does not deny the fact that intoxication (particularly alcoholic) of the parents at the time of procreation is in all probability a frequent cause of epilepsy and degeneracy in the offspring, specific proof to that effect is lacking. The difficulties are detailed, which render it practically impossible to trace the direct results of intoxications in individual cases. Statistics are also untrustworthy for many reasons.

2. *Epilepsy*.—That alcoholism in parents is a frequent cause of epilepsy in their children has long been considered probable, but the fact that the alcoholic is often inebriate because he is neuropath complicates the situation, as the epilepsy may be the result of the neuropathic condition. Working on this basis, the author deduces from statistics that neuropathic conditions are more common in the Jewish race, and that both alcoholism and epilepsy are less common than in other races, thus establishing a closer relationship between these two conditions.

3. *Rabies and Infection*.—A man of 24 years, with doubtful infection with rabies, was given protective inoculations; after the eleventh injection he developed chills, fever and vomiting. No more injections were made. Three days later he had retention of urine for a few hours. The fever lasted about a week. The reflexes were increased, much general weakness was present with pain and tenderness in the legs. At the end of two weeks a peripheral left facial palsy appeared, three days later involving the right side also. In a few days improvement began ending in complete recovery.

4. *Syphilitic Poliomyelitis*.—A woman of 46 years with a specific history of 15 years standing developed symptoms of poliomyelitis, complete paralysis appearing in all of the extremities within a few days, ending in death about two months later. Pathologically, the lesions were found to be syphilitic and localized almost exclusively to the anterior horns of the cord and most marked at the enlargements.

(Vol. 27, No. 23. December 1)

1. Hysterical Deafmutism. LAQUER.
2. Symptoms following Gunshot Wounds of the Occipital Lobe. MINGAZZINI.

1. *Hysterical Deafmutism*.—A case of complete deafmutism is reported in a student of 22 years. The condition came on suddenly after worry and excitement, and had been present for nearly three weeks when the author began treatment by means of reëducation and suggestion which resulted in complete recovery three weeks later. After reviewing similar cases in literature, he considers the use of hypnotism in hysteria which he decries, believing with Liebermeister that it is easier to cause hysteria in a well man than to permanently cure a hysteric by means of hypnotism.

2. *Occipital Lobes*.—This article is the report of a case of gun-shot wound of the occipital lobe with resulting permanent incomplete quadrantanopsia, and a review of similar cases that have been published.

(Vol. 27, No. 24. December 16)

(Contained no original articles.)

INGHAM (Philadelphia).

Journal de Psychologie, normale et pathologique

(Sixth Year. No. 4. July to August, 1909)

1. Affective Memory and Experimentation. TH. RIBOT.
2. The Fugues in Mental Pathology. B. BENON AND P. FROISSART.

1. *Affective Memory and Experimentation*.—Ribot declares that in Külpe's experiments, made upon seven individuals, in order to determine the reality and nature of affective memory (ability to recall particular feelings) there are so many uncertain contingencies that the only legitimate conclusion to be drawn from them is that the problem, when broken into its individual facts, is an exceedingly complex one.

2. *The Fugues in Mental Pathology*.—The fugue is a psycho-morbid state of activity, occurring most frequently abruptly, transitory, accidental and manifesting itself usually under the form of journeys, walks, runs, flights, etc. This clinical definition does not explain completely what a fugue is, nor does it suffice to differentiate it from closely related clinical states. In order that a fugue should actually be such, two conditions are requisite: On the one hand the victim, who has vanished must not return to his domicile, whether such action be the result of psychic disturbances that force him to remain away or he is simply incapable of finding his way back, the important point being on his part the more or less prolonged absence; while on the other hand his neighborhood who recognize this absence of his, is totally uncertain as to his fate. The fugue thus completed and defined obviously is important from a social and medico-legal standpoint and may involve questions of homicide, thievery, incendiarism, etc. Fugues may be studied in both a general and a detailed way.

(a) In general the clinical study of fugues is based upon the psychic state of the victims before, during and after their fugue, that is to say, upon the presence or absence of motives, of instabilities, of purpose in the patient, upon disturbances of the consciousness, of memory, etc.

(b) The particular clinical study of fugues includes:

1. Fugues occurring in second states of consciousness (ambulatory automatism so-called, ambulatory states followed by amnesia). Here there is no obsessional state at the beginning of the fugue, merely an irresistibility; no automatism or unconsciousness during the fugue; no doubling of the personality. By speaking of the fugue as being in a second state of consciousness, the author means to indicate that the subject, at the moment of his fugue, is in a particular state of consciousness. If there is a modification of the personality, it is only partial. These fugues are more usually attributed to hysteria than to epilepsy; sometimes to alcoholism.

2. Fugues occurring in impulsive degenerative states (obsessions and impulsions), these fugues being obsessional in origin and determined, like all obsessions, by the incessant return of the morbid idea of flight. The anguish, anxiety, moral distress of the patient steadily increase in spite of his struggles against them; the irresistibility grows; surrender steadily approaches. Impulsive fugues occur without forethought. The subject departs abruptly, without a definite purpose in view. When the fugue is terminated, his memory is not troubled by it.

3. The fugues that take place in acute delirious states are hallucinatory, illusional and confusional conditions.

Delirious, hallucinatory alcoholic intoxication may provoke a fugue, with or without motor excitement; amnesia ordinarily is incomplete and transitory.

Some similar and analogous fugues may occur under the influence of epilepsy, parturition, traumatism, overwork and predisposition, or at the beginning of states of dementia.

4. Fugues occurring in chronic delusional states. These take place under the influence of delusional ideas or interpretations of sensory disturbances, and of psychic hallucinations that are psychomotor and imperative; memory here is intact.

5. Fugues arising in maniacal states. Sometimes the delusional ideas cause these, but more often they are provoked by motor and intellectual excitement. Here the motives are most subtle, specious, bizarre; often extravagances and scandals occur in these fugues; memory is preserved.

6. Fugues occurring in demented states. Dementia præcox presents itself in a variety of clinical forms, and so the fugues that sometimes accompany it assume a multiplicity of forms. These fugues are seen in general paresis, organic dementia, senile dementia, etc.

7. Fugues observed among children are often due to emotional troubles and character defects.

8. Fugues among the soldiery are due to particular environment and condition of the subject.

The points to be settled in the diagnosis of a fugue are: (1) Is it a fugue? (2) If it is not a fugue, what states of mind may be confounded with the fugue state? It ought to be distinguished from habitual vagabondage, from automatism without the absence of the subject (automatism of somnambulism, procursive epilepsy), from mere separation from one's domicile without an actual disappearance, from repeated mismanagements, from simulation, etc. (3) If it is a fugue; of what variety is it? (4) Can the fugue be attributed to any special malady, a particular morbid entity?

It is not possible at the present time, according to the publications, to distinguish the epileptic fugue from the hysteric. It is doubtful if it will ever be possible, a conclusion which Heilbronner himself has arrived at.

The prognosis of the fugue depends upon the underlying psychic disturbances.

From the medico-legal and social standpoint, the fugue, depending upon the psycho-morbid state of the patient, sinks into insignificance in comparison with the latter. The civil and criminal responsibility of the subject is abolished so far as irregularities, misdemeanors, and crimes are concerned. By the state of absence which determines it, the fugue suppresses the capacity of the patient. The victims of fugues are often charged with the misdemeanor of vagabondage.

Infantile and military fugues should always be subjected to a special medical examination.

METTLER (Chicago).

Deutsche Zeitschrift f. Nervenheilkunde

(Band 35, Heft 3 and 4)

9. The Electrical Reactions in the Muscles, When the Temperature is Lowered, and Their Similarity to the Reactions of Degeneration. GRUND.
10. A Study of Traumatic Spinal Cord Affections. WINKLER AND JOCHMANN.
11. Huntington's Chorea.—Report of a New Case. CURSCHMANN.
12. Value of Measuring the Capacity of the Skull, etc. APELT.
13. Contribution to the Surgery of Spinal Cord Tumors. FLATAU AND ZYLBERLAST.

9. *Electrical Reactions*.—Little work has been done in this condition, on warm blooded animals. The author has conducted careful experiments on human beings, and dogs, recording his results by tables and charts. He discusses the characteristics of this reaction and its cause, showing how it is similar to the reaction of degeneration, and indicating that this condition should always be thought of when testing for reactions of degeneration. It is important, diagnostically, to exclude the presence of this reaction by warming the affected part, when the reaction will disappear.

10. *Trauma of Cord*.—The writers had opportunity of studying two cases, in which destruction of a portion of the spinal cord from trauma, with intact vertebral canal occurred. The clinical report is by Dr. Jochmann, the pathological by Dr. Winkler. The first case clinically diagnosed as acute myelitis was only correctly diagnosed at necropsy. The clinical study of this case suffered from the poor condition of the patient; of especial interest was the slow course of the paralysis. In this case it did not appear for two months; and complete paraplegia only occurred shortly before death. A study of the spinal cord showed a large wide-spread hematoma, extending from the first cervical to the lumbar region. Sections of the cord showed the degeneration incident upon such a hemorrhage.

The second patient was a 12-year old girl, who fell from a perpendicular ladder. The following day she complained of difficulty in walking, and paralysis of the lower extremities soon occurred. After 18 months the patient died. Section showed, as in the other case, no disturbance of the vertebræ. The meninges were intact, but the cord itself showed changes in its form in the cervical portion, where the anterior portion had atrophied and was unequal on each side. The condition extended through the third, fourth and fifth segments. This area had a yellow color and was of a soft consistency. Microscopically, there was noted a total destruction of nerve tissue with degeneration of the conducting pathway.

The origin of this condition can only be explained through a tearing of the cervical portion—due to an over extension of the spine. The first symptom appearing 16 hours after onset was the pain under the upper portion of the breast bone. The left leg was dragged and the child noticed that she could not raise the left arm.

From a study of the cases and necropsies in the literature the writer divides the secondary traumatic diseases of the spinal cord into the following: (1) Concussion, with or without noticable injury to the nervous tissue. (2) Crush of the cord—in severe cases associated with hemor-

rhage and destruction of nervous tissue. (3) Stretching of the cord and separation of the histological arrangement, with hemorrhage and softening. The localization of the lesion does not correspond always to the point of trauma. Usually it is a little higher or lower.

11. *Huntington's Chorea*.—Gives the clinical history of two brothers, Adam and Jacob Kamp, together with the family tree, in which a record is shown of four generations of Kamps. His cases show a uniform heredity, thus agreeing with most histories, though Hoffman has found a polymorphic heredity. Of clinical interest in the Kamps was the early onset, 27 years and 30 years, and the presence of a true dementia.

12. *Skull Capacity*.—Applied the method of Reichardt to a series of different clinical cases. The normal brain weight according to Reichardt should be 10-16 per cent. smaller than the cranial capacity. Increase swelling occurs when this is only 5 per cent. or less; and on the other hand atrophy is present if the percentage ratio is 20 per cent. or more. A study of 80 cases showed—first a group of 28 cases of patients suffering from chronic disease, without distinct circulatory disturbances. The brain ratio showed the weight per case of 11 per cent. less than the cranial capacity. A second group of 13 cases—chronic diseases with marked congestion in the circulation. The brain weight was 3 per cent. less than the cranial capacity. In the third group were included the infections, and the brain weight was 3.5 per cent. less than the cranial capacity.

13. *Cord Tumors and Surgery*.—Reports a case of extra-medullary spinal tumor. A woman, *æt.* 40, first complained of pain in her left foot, 3 months before admission. The pain increased and extended up to the left trunk. On the third day pain appeared in the right leg. The limbs now became weak until she was compelled to go to bed. Several weeks after the first symptom there developed bladder and rectal trouble. Examination showed weakness in the limbs, especially left; increased muscle tonus; increased patellar reflexes; ankle clonus and Babinski on both sides. Loss of tactile sensation in left leg and trunk as far as third intercostal space; analgesia and thermoanesthesia in the same region, and also in right leg extending as far as the umbilicus.

Sense of position lost in left lower limb. The pain became more intense on the right side; a spastic paralysis of the limbs was noted, and the sensory paralysis became symmetrical. Finally, there was total retention of urine, and incontinence of feces. At the operation a small sarcoma was found growing outward from the inner wall of the dura in the region of the seventh cervical. After the operation sensory function returned first. Two days later feeble voluntary movements were noted. The motor function gradually returned and patient made the first attempt to walk one month after operation. After five and one-half months patient was able to walk quite well.

S. LEOPOLD (Philadelphia).

Zentralblatt für Nervenheilkunde und Psychiatrie

(May 1 and 15, 1909)

1. Cure of Hysterical Barking Through Psychoanalysis. FANNY CHALEWSKY.
2. Apropos of Disturbance of Orientation in Relation to its own Body. RUDOLF ALLERS.

1. *Hysterical Barking*.—Chalewsky reports a case of hysterical barking occurring in a young girl of thirteen. A trauma brought forth the

attack, but psychoanalysis showed several traumata which were traceable to early childhood and which determined the symptom. By means of psychoanalysis complete recovery was affected.

2. *Orientation*.—Allers reports a clinical record of a patient in whom, while in "a state of psychogenic disturbance of consciousness in the character of a pathological attack," lost the ability to orient his body to the right or left side. The patient was 18 years of age, much confused, expressed few delusional ideas, and showed general motor unrest. Physically he presented a slight facial palsy (right) but it soon disappeared. The right arm was amputated about 15 cm. below the acromion process. Corneal and conjunctival reflexes were diminished and the pharyngeal was absent. Knee jerks were exaggerated and pupils were normal. Movements of the extremities were intact. Sensibility of the upper part of the body was disturbed. The patient was aware of his limbs, but could not differentiate them from each other "bilaterally symmetrically" as if he had no right or left leg. When he attempted to orient himself to the right or left, he would employ the amputated stump of his right arm for his guide, and apparently knew of its correct position. In reaction to auditory stimuli, the optic imaginations of the amputated arm came to his assistance. He regards the case of a functional disorder and considers both epilepsy and hysteria.

(June 1 and 15, 1909)

Apropos of Limitation of Manic Depressive Insanity. O. BUMXE.

Bumxe offers a critical review of manic depressive insanity. His article does not lend itself to review. It contains many thoughtful reflections and it would repay to read in the original. In general the author maintains that involution melancholia is not related to manic depressive insanity, and subjective retardation in the sense of Dreyfus is not a pathognomonic symptom of cyclothemic depression. In many respects he agrees with Specht that the mechanism of 'paranoia has some resemblance to that of manic depressive insanity. His limitation of manic depressive insanity is rather vague and his conclusions are still more indefinite.

Apropos of Hallucinatory Recollections. W. v. BECHTEREW.

Hallucinatory recollections are regarded such peculiar disease states in which the patients reproduce in their hallucinations former visual and auditory experiences. The author cites cases of epilepsy, hysteria, chronic alcoholism, hallucinatory insanity, and organic brain affections in which such false percepts were observed. In some of his cases of epilepsy hallucinatory reproductions were quite often the aura or the beginning of the attack. Hallucinatory reproduction has an analogy to a dream state or "the living over of a reality in a dream."

M. J. KARPAS (Zürich, Switzerland).

Book Reviews

EPILEPSIA. Revue Internationale Trimestrielle. L. Bruns, H. Claude, W. P. Spratling, Alden Turner, J. Donath and L. J. J. Muskens, Editors. Schiltema and Holkema's, Bockhandel, Amsterdam. G. E. Stechert, 127 West 20th St., New York.

The third number of this interesting international review has just appeared. It opens with the announcement of the formation of an international league against epilepsy, of which A. Marie, of Vellejuif, has been appointed the secretary. O. Hebold, of Wuhlgarten, writes on epileptic institutions, and Muskens on segmentary disturbances of sensibility. The bibliography that follows is particularly full and valuable.

This journal is now on trial and the publishers have made an excellent showing. It should receive the hearty support not only of epileptologists, but of all those interested in nervous and mental disease.

JELLIFFE.

[Subscriptions may be made through the JOURNAL OF NERVOUS AND MENTAL DISEASE.]

KLINISCHER ATLAS DER NERVENKRANKHEITEN. Von Dr. S. Schoenborn und Dr. Hans Krieger. Mit einem Vorwort von Geheimrat Prof. Dr. W. Erb, Heidelberg. Carl Winters, Universitätsbuchhandlung, Heidelberg. 28 Marks.

In the introduction Professor Erb tells of the origin of this atlas. It was really begun when he first was appointed to the Heidelberg Klinik in 1883. About that time the studies of muscular atrophies and dystrophies were beginning to yield their fruits and acromegaly and Thomsen's disease were being formulated. Photography was then called into the clinical field and a beginning was made in the collecting of photographs illustrative of interesting and rare nervous conditions. After twenty-five years Professor Erb had collected an enormous number of valuable photographs and this atlas is one of the results.

Neurologists have always admired the admirable reproductions of the French in their *Nouvelle Iconographie de la Salpetriere*. Here one finds equally as good reproductions, and fortunately all in one volume.

In all some 186 pictures are given, showing nearly every possible form of anomaly in which impairment of function is due to neurological disorder. Accompanying the illustrations is a short descriptive text. The work is well printed; the photographic reproductions most excellent, and all in all we have an iconographie much to be desired. It cannot fail to be of great service to teacher and student alike. As a collection for projection purposes in lantern demonstrations to students it will be particularly valuable.

JELLIFFE.

ÜBER DIE DEMENTIA PRÆCOX. Streifzüge durch Klinik und Psychopathologie, von Priv.-Dozent Dr. Erwin Stransky in Wien. Verlag von J. F. Bergmann, Wiesbaden, 1909.

DIE DEMENTIA PRÆCOX UND IHRE STELLUNG ZUM MANISCH-DEPRESSIVEN IRRESEIN. Eine klinische Studie, von Dr. Med. M. Urstein. Urban und Schwarzenberg, Berlin und Wien, 1909.

Stransky starts his discussion of the symptomatology of dementia præcox by calling attention to the very different impression this disorder makes on one than do such conditions as mania, melancholia, paranoia and amentia (confusion). These latter disorders seem to us to be due to the deviation of normal mental processes either to the positive or negative side; we can put ourselves, as it were, in the position of the patient, can feel his feelings in miniature. The differences are merely differences of degree, of more or less. With dementia præcox, however, the effect is quite different. The awkward, constrained attitude of these patients makes us feel quite out of touch with them, they seem unnatural, their acts "unpsychological," to coin an expression.

This fundamental difference in the impression created in us by the dementia præcox patient from that produced by other types of mental disorder Stransky traces to what he believes to be the basic factor in the symptomatology-intrapsychic ataxia. By this term he means a disturbance of coördination between the intellectual attributes of the whole psyche and the affective attributes, or as he calls them respectively the noopsyche and the thymopsyche. Intrapsychic ataxia might then be called more specifically a noo-thymopsyche ataxia.

This intrapsychic disturbance of coördination leads to a defect, the signs of which are much more marked in the emotional sphere than in the intellectual sphere.

Inasmuch as this disturbance of coördination is the most important expression of dementia præcox, according to Stransky, it will be worth while to go somewhat into the details of his description of it.

The coördination disturbance may manifest itself in different ways and in different degrees. The simplest way is by a lack of harmony between the expression of the affect and the idea content of thought. For example the patient cries when he should be glad, or vice versa, though much commoner than this contrasted reaction is an affective reaction which is inadequate—the patient merely simps or smiles when the facts would warrant sadness or hearty laughter. We come across anger from wholly indifferent causes; fear, timidity, shyness appear without any apparent reason; familiarity, obtrusiveness, eroticism occur, displaced, perhaps in the same situations in which there was formerly embarrassment, shyness, coldness. Quite commonly a certain state of feeling dominates all conditions of consciousness, a certain stupidity and apathy, a surprising poverty of affect, which is in strong contrast to the clearness which the patient may demonstrate. Cold and passive, without so much as moving an eye lash, without any spontaneous reaction, without expressing a wish, he is oriented to time and place and person, is conversant with everything going on about him, shows good school knowledge, his memory is faultless, shows up well in an examination of his intelligence, and denies feeling sick. However, he shows no longing after freedom, or feeling of sadness at his position; these all appear extinguished in him. This coldness produces an unnatural impression. One gets the impression of the dream state in epilepsy, the mental state of which has a certain symptomatic relationship with many forms of dementia præcox.

The lack of conformity of the emotional reaction and the idea content is shown not only with reference to a given time but in relations of succession. Moods and affects change in all possible ways without visible inner or outside causes. Here we see the same ataxic tendency. The April-weather behavior of the affects and moods suggests the relationship with hysteria. There fails here, however, the hysterical humor, based upon the hysterical character and producing the theatrical manifestations.

It is the psychomotility which is the outward projection of the inner life and from its expressions we are obliged to reason back for an understanding of that inner life. It is the actions of these patients, in other words the psychomotor ensemble which is so characteristically "unpsychological" to the observer.

There is a failure of the inner stimulus to psychic activity which springs from the emotional life, the interest tone and emotional tone of ideas which determine the inner psychic life normally, are lacking. The lack of initiative, and emotional poverty of such patients easily awakens the idea of dementia, which under the stimulus of conversation, so far as the patient has not become indolent to it, is not borne out. When such patients are let alone, or are not accessible to simulation they may, however, sink into a deep grade of dementia.

Stransky describes the usual classical forms of hebephrenia, catatonia, and the paranoid variety. He also lays stress upon the heboid of Kahlbaum. These cases are essentially mild in their course and reach only a defect of light degree, mostly affecting the ethical sphere. Here we find harmless fools, pseudo-geniuses, bohemian natures and certain satellites and parasites of the artistic and literary. We find also in this group vagabonds, prostitutes, and criminals. A rudimentary form is further described in which the disturbances are less marked, less characteristic than in the heboid. These are abortive cases, or cases that remain stationary for a long time and develop mental weakness only after a considerable duration. The symptoms are only appreciable to the skilled observer. They are exhibited by fine nuances, certain singularities of behavior, mannerisms, bizarreness, stupidity. This type is found often among the upper strata of society, among the educated. The intimate relation of hebephrenia and catatonia is specially called attention to and also the frequency of intermediate forms partaking of the symptomatology of both.

Stransky discusses the pathogenesis of dementia præcox, and while he admits a certain affinity between the hebephrenic-catatonic disposition and hysteria, he goes no further with Jung, but believes all the indications point to dementia præcox as an organic disease. Particularly the signs of an organic affection are its tendency to progress, and the accompanying bodily disturbances such as cyanosis, edema, increased tendon reflexes, muscular irritability, disturbances of nutrition, and menstruation.

The differential diagnosis has to be considered with reference to: states of psychic defect—often impossible without prolonged observation; myxedema—especially the formes frustes in which the bodily symptoms are lacking; paresis; psychic defect due to localized brain lesions—especially with reference to aphasic jargon, aphasic contamination with catatonic word salad, or corresponding neologisms; traumatism; the catatonic states of advanced age; the neuroses—neurasthenia, hypochondria, anxiety neurosis, and compulsion neurosis; hysteria; simulation in criminals; manic-depressive insanity—mixed states do not lead to a deep psychic dissociation but consist simply of the combined single symptoms of the manic and depressive phases; paranoia—the delusions of bodily

control and constraint as well as the related hallucinatory content, at times imperative auditory hallucinations, speak for dementia præcox; amentia—often difficult, at times impossible to differentiate; alcoholic hallucinosis; and epileptic dream states.

While the work of Stransky is brief, to the point and excathedra in style, that of Urstein is very different. It is a ponderous tome, consisting of the analysis in great detail of cases the results of which are summarized in a rather wordy dissertation of something over one hundred pages. The entire work, too, is devoted to the relatively restricted question of the position of dementia præcox in relation to manic-depressive insanity.

This study is based upon the examination of one thousand patients, some of whom had been fifteen, twenty, thirty, and even forty years in the asylum. Many of the cases that had been discharged were sought out in their homes and examined there.

Urstein believes also that intrapsychic ataxia and emotional deterioration are the fundamental symptoms of dementia præcox. He lays stress also upon the following symptoms: feeling of insufficiency—the patients are easily tired, find themselves unable to work, feel weak and stay in bed; feeling of change—they do not feel as they used to; feeling of inner emptiness and desolation—a feeling of inner emptiness and apathy, feeling inside as if dead, dissatisfaction with life, no love for relations and friendlessness; ennui; intrapsychic inhibition—impossibility of thinking, of finding words to express themselves, of collecting their thoughts, feeling of stupidity, the head feels no longer clear; distracted, forgetful, impossibility to concentrate, confusion; feeling of anger and confusion in the head; lack of energy and resolution; irritability; feeling of lack of personal unity, separation, doubling, splitting of the personality.

This list of symptoms shows well how much of the symptomatology is centered about the affective sphere.

In the anamnesis one may find headaches, nervousness, depression, attacks of vertigo and faintness, melancholic ideas and even attempts at suicide, or on the contrary silly activity, and changing mood.

Urstein, like many other authors, speaks of the frequency with which hysteriform attacks usher in the picture. In fact hysterical symptoms often continue to be solely in evidence for months before catatonic symptoms supervene.

In connection with bodily symptoms the occurrence of gastric disturbances, often periodically, is noted in all forms and is of importance as an aid in differential diagnosis in the early stages.

There are certain cases that appear as delirium in the first attack. These are difficult to diagnose as they simulate the cases of the amentia group, and also sometimes mixed states of manic-depressive psychosis. They terminate in a typical catatonic end state.

Many of the case histories, with their descriptions of excitements and depressions, Urstein thinks might easily be mistaken for manic-depressive histories except that such expressions as "empty," "superficial," "total loss of affects" should direct attention to a præcox diagnosis. Here we find again a sign of the fundamental symptom of intrapsychic ataxia.

In connection with the symptoms of intrapsychic ataxia and intrapsychic inhibition Urstein calls particular attention to the not infrequent discrepancy between the spoken and written productions. He illustrates from his cases by a patient who according to his own evidence could scarcely correctly fix a single thought and yet wrote endless but quite correct

letters. Another patient, during his depression, could not comprehend the simplest sentence, yet was able to conduct a long dispute.

This incongruity is due to the intrapsychic ataxia. That the complaints of subjective inhibition, especially the dissociation, is found also in manic-depressive psychosis Urstein doubts, though he is not prepared to say with reference to the hysterical and degenerative psychoses. Kraepelin says that in manic-depressive psychosis the voluntary inhibition is such that speech and writing are not always affected to the same degree. There are patients who can hardly produce a single line of speech who, on the contrary, write long, impassioned letters "while they become mute so soon as one endeavors to examine them." And also of the mixed states Kraepelin says there are patients who cannot express themselves by speech who yet, to our astonishment, write letters full of ideas of sin and delusional fears.

Urstein believes this discrepancy between spoken and written productivity speaks against the diagnosis of circular insanity. The "mutism, so soon as one attempts to examine the patient," he would explain as catatonic negativism. The result in this case of Kraepelin's is not known. The possibility of such states in manic-depressive psychosis is not to be denied, but all of his patients who could not or would not express themselves—the distinction is difficult—yet in letters expressed flight of ideas, numerous ideas of sin and delusional fears and later changed and became maniacal, finally came to the state of catatonic dementia.

This distinction between spoken and written productivity certainly should make us think of Wernicke, an author too often forgotten in these later days. We are reminded of his localization conceptions, especially in view of the recent studies of the deep layers of the cortex in dementia præcox. May we not here be dealing with phenomena which will find their explanation in differences of localization? Not localization in the old sense of the term that must needs to differentiate a definite area of cortex, but localization in the sense of Wernicke when he pronounced insanity to be a disease of the organ of association.

All of the manic-depressive symptoms may be found in dementia præcox. With the manic-depressive symptoms, however, there are usually combined some catatonic symptoms that make the diagnosis of manic-depressive psychosis doubtful. There are though, a certain few patients who present clear pictures of depression, or manic excitement, who may get well from repeated attacks and finally present typical catatonic dementia. This confusion of diagnosis is most apt to arise in connection with the mixed states. Neither the clinical form, the temporal peculiarities—periodicity—nor the passing of the two symptom groups over into one another shuts out the diagnosis of dementia præcox. Urstein questions whether we are justified in accepting the manic-depressive psychosis as a clinical entity, because so many of the cases showing this picture dement, although he admits that a number of cases do follow the theoretical course of the psychosis accurately. His criticism of the unity of the manic-depressive group is directed with special force against the mixed states.

Towards the end of the general part of the work Urstein indulges in a somewhat lengthy criticism of the views of Wilmanns and Dreyfus. If perhaps dementia præcox has been too frequently diagnosed at the expense of manic-depressive psychosis, still these authors he thinks, have widened the conception of the circular psychoses altogether too much.

In the matter of diagnosis we must never forget that there is no symptom, no symptom-complex even, which for a single disease form is pathognomonic. Catatonic symptoms are common enough in paresis, cerebral syphilis, tumors, and other psychoses. These symptoms are expressions of fundamental, personal make-up and are of more prognostic importance, where they occur, than periodicity. Manic-depressive attacks which show catatonic symptoms have a better prognosis than *præcox* so far as remissions are concerned, but their prognosis with respect to the end result corresponds to that of *dementia præcox*.

Urstein, while willing to acknowledge manic-depressive psychosis as a clinical entity, thinks it does not occur nearly so often as the Kraepelin school thinks, and is convinced that the so-called circular psychoses need complete revision.

Dreyfus is rather severely handled. He is accused of making a diagnosis of manic-depressive psychosis on the basis of a single symptom—"a typical circular moment."

The work closes with a casuistic section of some two hundred and fifty pages descriptive of thirty cases.

These two works contain very little, perhaps nothing, that is new. They agree on the fundamental symptom of *dementia præcox*—intra-psychic ataxia. They both touch, the former by inference, the latter directly, upon the extremely important border land of this comprehensive and, as yet, little understood condition.

This abstract and review might well serve as a text for a preachment against classifications. Not that classifications have no place, but that they are valued too highly. We must come to a more general understanding of the mental and to a fuller realization that the individual reacts to his milieu by the development of mechanisms that may include as parts the crass physical at one end, the refined psychic at the other.

The symptom picture of any psychosis must be dependent then upon two factors—the personal make-up and the etiological moment (using this term in its broadest sense as meaning the determining cause of symptoms—in this sense it would include an organic, pathological condition. Only with such a viewpoint can we understand these border-land conditions.

There is no law in medicine that makes it impossible for an individual to have two diseases at the same time. A person with pulmonary tuberculosis may break his leg; appendicitis and cholecystitis are not mutually exclusive, while no one would deny that a paranoiac might develop paresis. Why then may not a person with a manic-depressive character develop as the result of efficient etiological moments, a *dementia præcox*, or a person of *præcox* type develop a manic-depressive reaction? We must believe this possible or else fail absolutely to comprehend the mechanisms of our cases.

To be sure, we would expect the person of manic-depressive temperament to develop a manic-depressive psychosis, and the person of *præcox* make-up to develop *dementia præcox*. But in some way that we do not understand, the etiological factors operate to change this expectation in a certain number of cases. The two conditions are much more nearly related than has been supposed, although the difficulty of evaluating such symptoms as subjective insufficiency, and retardation has always pointed to that conclusion.

The same sort of statements might be made with reference to hysteria and *dementia præcox*. The existence of hysterical symptoms preceding

or associated with an attack of præcox has always called for an explanation. Instead of accepting, what seems patent enough, that the two conditions occur together all sorts of sophistry has been indulged in to avoid this conclusion.

All this preaches the moral that the important thing is an understanding of the patient, not a labeling of the psychosis. To this end must be had a comprehension of the character make-up, the nature of the etiological factors, and the mechanism of the reaction. So much at least must we know and then whether we give one name or another to our resulting conception, or no name at all, matters little.

WHITE.

THE PRACTICE OF MEDICINE. James Tyson, M.D., Professor of Medicine in the University of Pennsylvania and Physician to the Hospital of the University. Fifth Edition, Revised and Enlarged. P. Blakiston's Son & Co., Philadelphia. \$5.50. Net

This text-book is well known and in its fifth revised and enlarged edition will continue to find its place as before.

The chapters on nervous diseases has been much amplified and the proof sheets have been read by Dr. W. G. Spiller. This of itself is a guarantee that no errors will be found. The chapters in aphasia and apraxia have been rewritten. Marie's views on aphasia are presented briefly. For a text-book presentation these chapters on nervous diseases are excellent.

Nothing is said of mental troubles. They still seem to fall outside the field of medicine. Only when chapters on mental disorders are included in regular text-books of practice can one hope to make any headway against the hopeless ignorance of the general practitioner regarding the most important organ of the body, *i. e.*, the brain. Barbers need diplomas, but any fool is competent to treat mental disorders, and unfortunately there are thousands of them doing it.

JELLIFFE.

BORDERLAND STUDIES. Vol. II. George M. Gould, M.D. P. Blakiston's Son & Co., Philadelphia.

Dr. Gould has had reprinted in this volume some sixteen articles which have appeared in periodical literature. They are well worth reading, although none deal directly in these pages with the specialties concerning us.

BROWN.

LES MERVEILLES DE L'HYPNOTISME. Par le Docteur Gérard Bonnet. J. Roussel, Paris.

The author has already given us two works on related subjects. In this he discusses the technique of hypnotism and gives a brief summary of the more striking phenomena, with consideration of the therapeutic possibilities. It is a short, readable, and systematic presentation of the chief features of this line of work.

BROWN.

The Journal OF Nervous and Mental Disease

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OBSERVATIONS ON A CASE OF PROTRACTED
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CORRELATION WITH ASCENDING MENINGOMYE-
LITIS, CRANIAL NEURITIS, SUBCORTICAL EN-
CEPHALITIS, AND FOCAL ENCEPHALOMALACIA
FOUND AT AUTOPSY¹

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AIDED BY

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We have been led to attempt an unusually elaborate correla-
tion of anatomical and clinical findings in the present case of
cerebrospinal syphilis, the whole course of which lasted nineteen
years, the patient being under observation of one or another phy-
sician off and on for sixteen years. The modern methods of

¹Read at a meeting of the Boston Society of Psychiatry and Neurology.

neuropathological technique have permitted the supplementing of classical data concerning fatty degeneration (Marchi) and fiber tract destruction (Weigert) by new data concerning the progress and stage of sclerotic processes (neuroglia fibril methods of Weigert, Mallory, and Benda). Moreover, if we correlate the neuroglia fibril data with the results of cytological examination, especially of the exudative cell series, we can arrive at approximate accuracy in arranging the lesions we find in the order of their occurrence.

For example, in the present case, we can correlate with some assurance (1) the *spastic gait* with exaggeration of leg tendon-reflexes, in association with *pains in the back* and *hyperesthesia of skin of chest* (1901-2), with an intense acute inflammatory process resulting in complete inter-adhesion of the thoracic meninges and a condition amounting to transverse myelitis, the inflammatory process and resultant peripheral gliosis constantly more dorsal than ventral in position, and (2) sudden spells of *impairment of vision* (strabismus) and *tinnitus aurium* (1902) with focal and patchy cranial neuritis and peripheral gliosis about superficial origins of nerves.

But we are clearly not in a position to judge what may be the finer correlations between the very variable symptoms just mentioned, and given in more detail below, and the histological alterations (acute inflammatory and reparative changes, nuclear sclerosis, periradicular gliosis, intraradicular gliosis, and so on) mentioned below under the heading *cranial nerves*.

We are perhaps still less able to show what lesions are, and what are not, susceptible to antisyphilitic treatment. We are able to show, however, that even at the time of death, when most of the lesions had become stationary, there was still evidence of a relatively acute cellular exudation about the upper segments of the spinal cord; and a certain optimism in the persistent use of antisyphilitic treatment is thereby encouraged.

There is less ground for drawing correlations between the patient's mental disorder and the various lesions. It is a curious fact, however, that, contrary to the usual rule according to which the more delicate outer mechanisms of the cortex suffer first, the nervous system of this subject was persistently attacked *from below*. At a period when there existed peripheral nerve atrophies, transverse myelitis, extensive bilateral lesions of corpora

striata, encephalitic foci of the cerebral white matter, and even a certain degree of injury to the lower layers of the cerebral cortex, the outer layers of the cerebral cortex remained fairly well preserved.

The clinical facts respecting the mental symptoms are, that, except for certain delusions and for a marked though intermittent irritability toward her nurses, the patient retained a fairly good mental capacity until the latest stages of the disease. She would indeed frequently surprise those around her by the coolness and clearness of her reasoning; to be sure, within rather narrow lines. Her optimism suggests, to be sure, a morbid expansiveness of emotion, and the two slight epileptiform seizures might be counted as possibly analogous to those of a dementia.

The history of the cord involvement is important in view of the fact that the atrophy of the thoracic cord can be shown histopathologically to have been due to several factors: (1) secondary degeneration of motor tracts from bilateral involvement of corpora striata; (2) secondary degeneration of tracts of exogenous origin from destruction of entering roots by severe meningitis; (3) degeneration of tracts at the periphery of cord as an immediate outcome of the meningitis. The only fibers preserved in the lower cord are the short fibers in the immediate neighborhood of the gray matter. Histopathologically, the peripheral sclerosis following the meningitis is of chief interest. The extensive lesions elsewhere are assignable to (*a*) plugging of arteries, (*b*) secondary degenerations following destructive lesions, (*c*) effects of meningitis. The organs of the trunk showed numerous lesions of vascular origin.

The histological work had been done with general and special methods, notably with the methods of Mallory for neuroglia and connective tissue and with Weigert's myelin sheath method.

The lesions of the cerebellum in this case have been described more particularly by Southard.²

CLINICAL HISTORY (J. J. P.)

This patient was first seen by Dr. Putnam in June, 1898, at which period she was 32 years old. She had been married in 1885; was without children and gave no history of miscarriages. The husband was tabetic and admitted syphilis. In 1889 the patient had had iritis, paresis of the left eye-muscles and ulcera-

² Southard, E. E. "The Neuroglia Framework of the Cerebellum in Cases of Marginal Sclerosis," *Journal Medical Research*, August, 1905.

tion of the throat with destruction of the uvula, for which she had been treated at different periods by Drs. H. H. A. Beach, J. O. Green, S. W. Langmaid, and Hasket Derby, all of whom had recognized the nature of her disease and had given her the appropriate treatment. Unfortunately this treatment had not been pushed to the curative point, partly because the patient had never remained steadily under the care of any one physician.

The clinical record may be summarized as follows: The patient was the only child of parents both of whom suffered from cerebral disease with mental symptoms, the father having died of what was called softening of the brain, the mother having been in a private hospital for the insane for a number of years before her death, with confusion and emotional depression. As a child, the patient was talented but somewhat nervous and eccentric. At one time she had an attack of hysterical dysphasia and at another time of hysterical dyspnea. She also had, during a certain period, an obsession which induced her to kick the mopboard at regular intervals. For many years before Dr. Putnam's attendance she had suffered from migraine of a severe and somewhat unusual type, and this is noteworthy because the migrainoid tendency seemed to mix itself in with the symptoms due to actual brain lesion and degeneration. The minutes made on June 10, 1898 say: "The patient had a very severe attack of migraine (?) yesterday, preceded and accompanied by paraphasia, so severe that for three hours she was unable to make herself understood and indeed felt 'as if her ideas were getting away from her.' This attack was ushered in by a numbness of the forefinger and thumb of the right hand which lasted for about three hours though the earlier attacks had usually lasted only for about ten minutes. During this period the hand felt as if it had been frozen and the loss of muscular power was so great that she was unable to hold objects in the hand. In some of the attacks this paresis has affected the entire left half of the body and occasionally the right half. Sometimes the seizures come on with great suddenness, so that once, when she was attacked while in the middle of the street, she had considerable difficulty in reaching the sidewalk. After the worst part of the attack is over a certain amount of paraphasia may persist for some days, together with awkwardness in the use of the right hand and numbness. She has had a great deal of nausea and vomiting, without reference to the taking of food."

The physical examination showed a systolic murmur at the apex and base of the heart, which, however, was obviously of functional character, and passed away later. The second aortic sound was somewhat accentuated. The left pupil was larger than the right but both reacted well to light. The urine was analyzed and found to be substantially normal. The patient at that time was put on a course of potassium iodide, in increasing doses, and biniodide of mercury.

The patient then passed out of Dr. Putnam's hands, and he did not see her again until May, 1902, when she was referred to him again by Dr. C. F. Folsom, who had been recently called to examine her. She was still subject to the migrainoid attacks, but it was found that, in addition, serious symptoms of a transverse myelitis had set in (during the summer of 1901), preceded by severe pains in the back, the significance of which had not at first been recognized. Her gait had become very spastic, so much so that she could not walk alone, and the tendon reflexes of the legs were all very much exaggerated, especially those upon the left side. The leg and foot muscles were seized from time to time with severe and prolonged cramps. There was incontinence of the urine and to a great extent of the feces. Cystitis was also present. One very distressing symptom of especial interest was a hyperesthesia of the skin over the chest, especially on the left side, and this was so severe that the contact of her clothing caused her great annoyance. She had had recently two or three slight epileptiform seizures without complete loss of consciousness, each lasting about five to eight minutes. Her mental condition was slightly disturbed to the extent that she was very irritable and excitable and a little violent, occasionally striking out petulantly at her nurse. Although she ate a large amount of food she had a species of delusion that she was suffering from loss of appetite. Her sleep would have been good except for the involuntary micturition. In August of the same year she began to have attacks of impairment of vision (probably due to slight strabismus) coming on suddenly and at short intervals, and with these there was sometimes sudden loss of hearing of similar duration, with ringing in the ears. Sometimes twenty such attacks would occur in one day, each lasting three or four minutes.

Under large doses of potassium iodide and mercurial inunction all these symptoms were considerably relieved, the change being especially striking with relation to the hyperesthesia of the chest, which disappeared altogether for a considerable period.

The treatment was pushed from time to time to the limit of endurance, although it was necessarily interrupted occasionally on account of increased micturition due to the iodide, and of a threatening of salivation.

During the next year she did fairly well, but sometimes suffered from new symptoms or an exacerbation of old ones. Thus she thought herself watched and became suspicious of those around her; when she went out to drive she was possessed with the idea that absent relatives were waiting for her at home; at times she would have attacks of hysterical laughter, especially when attempting to walk. In spite of early improvement the difficulty in locomotion began after a time to gain ground, and in the course of 1904 she became practically confined to her chair. A blurring of vision due to paresis of the muscles of the eyes,

especially of the left, made its appearance occasionally, then yielded to treatment, but finally reached a point when it would no longer yield.

The variability of certain symptoms, partly but not wholly to be explained as the effect of the treatment, was in some respects very remarkable. Thus, in the course of 1904 her hearing became rapidly impaired so that at last she was absolutely deaf and no communication by the voice was possible; yet some months before her death (1905) she improved for a short time rapidly and remarkably in this respect, although in other respects emaciated and suffering from the infection of huge bedsores. Finally the hearing was again, and this time permanently, lost.

In similar fashion, the knee-jerks, which had been exceedingly exaggerated, disappeared about November, 1904, but again returned for a brief period a short time before her death.

From November, 1904, she was completely paraplegic and at about the same date, or somewhat earlier, the movements of her hands and arms, which until then had remained free, began to suffer. Her mental condition deteriorated steadily throughout the last year, but she still clung, as if with the tenacity of obsession, to the belief which she had entertained throughout, that in the end she would get well, and when hardly more than a ray of intelligence seemed left she still showed a childish delight at the gift from her husband of a valuable ring which she had long desired.

Several months before her death bed-sores made their appearance on the sacrum and on the feet, and in spite of the most vigilant care increased to an enormous depth. These sores gave rise to infection, and to fever of a septic character, in spite of which she showed the tenacity of life characteristic of the long-time invalid, dying finally on February 7, 1905, after lying practically unconscious for several days.

SUMMARY OF CLINICAL FINDINGS

A woman of 23 acquired syphilis in 1889. In 1894 she began to suffer in an exaggerated form from a constitutional tendency to severe headaches, resembling migraine and accompanied by attacks of paresthesia. In 1901 the patient began to have severe pains in the back and difficulty in walking. In 1902 the migraine was accompanied by blurring and dizziness, the difficulty in walking became extreme, affecting particularly the right foot, and the legs became spastic. There were pains and hyperesthesia of the chest and severe cramps of the legs. These symptoms improved under antisiphilitic treatment. In the middle of 1902 came transient losses of vision and of hearing besides irritability and delusions about her relatives and a few epileptiform seizures. In 1904 total deafness; improvement later. Variable involvement of the eye muscles with intervening improvement. Loss of knee

jerks; later partial return. In November, 1904, absolute paralysis and extensive decubitus. Death in 1905, at the age of 39, four years after the onset of the myelitis, eleven years after onset of earliest nerve symptoms, sixteen years after acquiring syphilis.

GROSS FINDINGS AT AUTOPSY (E. E. S.)

Slender woman of middle height. Extensive sacral decubitus. Open ulcers of inner surface of feet. Skin of abdomen shows numerous dark brown macules, varying in diameter from .5 to 1 cm. Traces of mercurial inunction over breasts. Pupils wide; left pupil 8 mm., slightly irregular. Hair black.

Trunk.—Abdominal fat 1.5 cm. deep. Peritoneal, pleural, and pericardial cavities normal. Heart: Weight 190 grams. Epicardial fat slight. Muscle slightly opaque-yellow. Endocardium and valves normal, except for a slight thickening of mitral valve edge without notable shortening of chordæ tendinæ. Coronary arteries normal. Lungs: Apices slightly puckered over minute firm brown and black pigmented areas. Similar brownish pigmented area, at upper border of middle lobe of right lung, externally suggesting infarct, on section brownish and in places gelatinous. Pulmonary arteries show faint traces of sclerosis. Bronchi contain frothy fluid. Bronchial lymph nodes small and black. Spleen: Small, firm, only slightly pulpy, with markings distinct. Liver: Almost one-third enlarged, with rounded border, fatty. Gall Bladder: Normal. Gastrointestinal Tract: Externally normal. Pancreas: Normal. Kidneys: *Left* reduced to a pouched sac, from .25–.5 cm., thick, filled with foul smelling fluid and communicating with a dilated ureter which gradually loses in calibre till it opens in a slightly pouting papilla. A probe readily passed from bladder into ureter. *Right* kidney large. Markings distinct. Cortex shows a diffuse slightly opaque yellow color, more marked in radii corresponding with tubule systems. Right ureter of normal size and appearance. Adrenals: Normal in gross (but v. microscopic examination). Bladder: Firmly contracted. Wall very thick at fundus. Genitalia: Externally normal.

Head.—Scalp normal. Calvarium: Heavy and with little diploë. Dura adherent to parietal bone. Arachnoidal villi: well developed. Inner surface of dura moist with a slightly stringy fluid containing a few fibrin threads. There are a few adhesions between dura and pia over central convolutions external to the zone of arachnoidal villi. Pia shows clouding over sulcal veins, notably over vertex and along Sylvian fossæ, and diffuse thickening over tops of gyri in vertex region and over superior vermis, besides several foci in both hemispheres of cerebellum. Pia peels readily but the small vessels are a little stiffer than normal. Optic nerves bound to base of brain by a thin but dense sheet of fibrous tissue. Wall of cisterna slightly thickened. Pia over pons and medulla notably thickened.

Cranial Nerves.—Olfactory nerves normal. Optic nerves of the usual diameter with a thin translucent outer zone. Left third nerve normal; right third nerve about one-third the diameter of the left. Fourth nerves equal and apparently normal. Sensory portion of left fifth nerve thinned out; right fifth nerve normal. Left sixth nerve normal; right sixth nerve reduced to a thread at a point 2 mm. from superficial origin. Left seventh and eighth nerves thinned out. Right seventh and eighth nerves normal. No macroscopic changes in the other cranial nerves.

Vessels.—Right vertebral artery reduced to a thread. Left vertebral artery small, upon incision shows a longitudinal raised line of sclerosis. Carotid arteries slightly stiff. No other gross evidence of sclerosis.

Substance.—Fairly firm. Convolutions suggest a slight general narrowing of the cortex, but this has produced a demonstrable flaring in a few areas only, notably just behind the posterior central convolution of the left side, about 6 cm. from longitudinal fissure. There are numerous small, ill-defined areas of hyperemia and slight swelling in the cortical gray matter, of irregular distribution and a few millimeters or centimeters in diameter. These areas are very faintly visible from without. No vascular lesions are demonstrable in connection with the focal lesions. Centrum semiovale normal. Fibers of forceps minor and tape-tum cut with difficulty.

Ventricles.—One-third dilated. Ependyma of floor of bodies of both lateral ventricles shows a brownish discoloration, corresponding with the extent of the caudate nuclei. Ependyma elsewhere normal, except over the floor of the fourth ventricle which shows a fairly marked sanded appearance.

Basal Ganglia.—Show on section roughly symmetrical destructive lesions of the corpora striata: (1) The intraventricular portion of the caudate nucleus is on both sides reduced to a lamina 1–2 mm. thick corresponding with the discoloration of ventricle floor. (2) The anterior segment of the internal capsule is on both sides reduced to a densely cutting lamina with the fiber bundles somewhat more widely separate than normal. The anterior segment on the right side is more markedly affected and is almost bisected by a cystic cleft running up from the lenticular nucleus below. (3) Both lenticular nuclei are largely replaced by a grayish tissue, in places discolored but nowhere injected and retracting under the knife to give the appearance of ill-defined cystic clefts containing a semi-gelatinous cloudy fluid.

No other focal lesions occur except in the cerebellum. Marginal convolutions of cerebellum show thinning of cortical substance, best marked near superior vermis and along posterior notch. The outer portion of the amygdala and inner portion of the biventral lobule on the left side show a destructive lesion with depression 1.5 cm. in diameter by .5–7.5 cm. in depth. The de-

pression is lined by brownish moist pia mater, dipping gradually down from the surrounding marginal convolutions, which show a well marked cortical atrophy. The lesion on section shows effacement of normal markings and a smoothly cutting jelly-like brown substance, here and there yellowed and slightly opaque.

Spinal Cord.—Dura thicker than normal, notably along thoracic cord. Arachnoid space contains numerous fibrous adhesions and is quite obliterated in the thoracic region. The cord on section is considerably, perhaps one-fourth to one-third, reduced in diameter, notably in thoracic and lumbar portions. The outer border of the cord is everywhere abnormally translucent for a distance of .2-.3 mm. The pyramidal tracts, the direct cerebellar and anterolateral tracts, and the upper and outer portions of the tracts of Burdach show symmetrical gray degeneration throughout the cord. The tracts of Goll vary, although symmetrically, in the amount of gray degeneration shown; in places there is a considerable triangular white column in this region with its base applied to the gray commissure. The only white matter regularly preserved throughout is the ventral field of the posterior columns and the anterolateral ground bundle; the processus reticularis is particularly prominent. In the thoracic and lumbar regions the gray matter is relatively reduced in amount. In the lumbar regions, within the gray matter, there is an occasional minute cystic cleft on section, corresponding with the anterior horn, and an occasional minute lesion (under 1 mm. in diameter) with a white center and brownish translucent border (one noted in processus reticularis in lower dorsal region). The white fibers of the anterior roots are prominent, as they pass from the lumbar anterior horns to the periphery of the cord, by reason of the gray degeneration of the whole anterolateral columns in this region. The cauda equina shows a notable thinning out.

ANATOMICAL DIAGNOSES

Atrophy of cortex of cerebrum and cerebellum and of spinal cord. Chronic diffuse cerebrospinal leptomeningitis, notably of vertex, base, and in thoracic region of cord. Adhesions between dura and pia over vertex. Symmetrical destructive and atrophic lesions of gray matter of both corpora striata, with atrophy of anterior segments of internal capsules. Induration of forceps minor and tapetum. Atrophy of right third and sixth, left seventh and eighth, and sensory root of left fifth cranial nerves. Destructive lesion of amygdala and biventral lobule of left cerebellar hemisphere. Gray degeneration of long tracts in spinal cord. Destructive focal lesion in anterior horns in the lumbar region of cord. Atrophy of fibers in cauda equina. Extensive decubitus. Macular discoloration of abdomen. Irregular pupils. Small fatty heart with slight chronic mitral endocarditis. Fatty

liver. Left hydronephrosis with dilatation of ureter (no cause for obstruction evident). Fatty kidney.

MICROSCOPIC EXAMINATION

Heart.—The fibers are unaltered except for the presence in a few of vacuoles containing fat. There are no demonstrable changes in framework or vessels.

Aorta.—All three coats of the ascending arch exhibit changes. The intima shows fibrous thickening in low waves, nowhere over 0.5 mm. deep. At the base of some of the intimal elevations are lighter areas with connective tissue cells and with fibrillæ; opposite such areas the media is slightly diminished in thickness. The media exhibits in the main a normal arrangement of tissues, but tends to cleave along a belt varying from one-tenth to one-third the diameter of the total zone. This belt in the media shows a loss of muscular tissue, an excess of fibrous tissue, and an apparent if not actual increase of elastic tissue. Beneath the lighter non-fibrillated areas at the base of the intima the tissues in the non-muscular belt show a few small vessels and some dislocation of elastic and fibrous bands, which run at several angles. The small vessels of the adventitia show a moderate infiltration of sheaths with cells of the lymphoid and plasma cell series.

Lung.—The air spaces are in places distended, in places collapsed, and sometimes contain collections of pigmented cells. Near the infarct the spaces contain many polynuclear leucocytes and there is purulent bronchitis. The walls of the spaces contain an excess of elastic fibers. In places there are large thrombosed and thrombosing vessels, some of them with quintuple or sextuple elastic layers. Some of the vessels are canalized.

The lymph spaces of the bronchial nodes contain numerous polynuclear leucocytes and mononuclear leucocytes not phagocytic.

Spleen.—The pulp contains much pigment, free and within cells, and a moderate number of polynuclear leucocytes. The muscularis of some small arteries shows hyaline deposit. Some of the Malpighian bodies show hyaline deposits with a few strands of connective tissue.

Liver.—Advanced fatty change with vacuoles of various size, some much larger than liver cells. Condensation of fibrous tissue in portal tissues with lymphocyte infiltration.

Pancreas.—A few vessels show an excess of fibrous tissue in the intima. Parenchyma and islands show no lesion.

Kidney.—Many vessels show a mild grade of intima proliferation. Occasional glomeruli are atrophied. There is in places a slight excess of intertubular fibrous tissue. The tubular epithelium is pale, swollen and granular. The pyramidal tubules contain many hyaline casts.

Adrenals.—Show several areas of infarction with occluded vessels.

CENTRAL NERVOUS SYSTEM

The lesions in the central nervous system are of very manifold character and may be considered under the heads of *cerebrum* (leukencephalitic foci, perivascular cellular glioses, subpial sulcal fibrillar glioses, numerical cell-losses in stellate and substellate layers); *basal ganglia* (cysts of softening), *cerebellum* (cyst of softening), and spinal cord (severe meningitis, especially thoracic, with duro-pial adhesions; peripheral gliosis, especially over lateral columns; mild chronic exudative myelitis, especially cervical; dilated perivascular spaces in gray matter). A note is added concerning the *cranial nerves* (irregular and patchy atrophy).

Cerebrum.—The microscopic examination of the cerebral cortex served to confirm the impression gained from the gross examination that strikingly few lesions exist therein.

There was a suggestion of *encephalitic foci* in the gross. The most convincing evidence of these foci microscopically consists in certain venous plugs of polynuclear leucocytes, found both in the meninges and in the cerebral cortex. The local hyperemias noted in the gross are microscopically found to be largely due to venous congestion. The evidence of acute encephalitis is exceedingly slender. An occasional polynuclear leucocyte is found in an extravascular position.

It is less easy to explain the local swellings than the attendant hyperemia. Nevertheless, there is one interesting finding in the white matter of numerous gyri, which may throw light on the local swellings. The white matter contains numerous small rounded or globular foci which stand out, in eosin-methylene blue sections, from their pallor. This pallor is in part due to faint staining of myeline sheaths, in smaller part to absence of some myeline sheaths and consequent spreading of structures within the focus. The neuroglia nuclei are in part swollen and highly vesicular and in part collapsed and pyknotic. These foci are not of universal occurrence. They do not appear to be directly related to vessels.

It is possible that these areas represent the earliest phases of a *leukencephalitis*, such as has proceeded to a far greater degree in the spinal cord. It is just possible that these areas represent the effects of syphilotoxines. The occurrence of considerable decubitus in the case gives rise to another hypothesis, however, that of intercurrent infection. It does not seem possible to decide between these hypotheses. A middle ground may be taken if we consider that such lesions are due to intercurrent invasions of bacteria or to introduced bacterial toxines which are somehow permitted to act through antecedent or existent syphilis.

At all events it is likely that a series of such leukencephalitic processes would favor progressive degeneration of the white matter and might prove to be essential steps in the syphilitic process.

In addition to areas of venous congestion and recent leukencephalitic foci, the cerebral convolutions show a few processes of more chronic type. There is a trivial degree of *perivascular gliosis* related with the larger vessels of the white matter; this gliosis appears to be somewhat recent. Scarcely more extensive, but a trifle older in date, is a mild subpial gliosis which is of greater degree in the sulcal depths than on the surface.

The mental phenomena clinically observed render cortical conditions of considerable interest. One feature common to all the areas examined is the relative intactness of the outer cortical layers as compared with the inner layers. The fusiform cell layer has suffered numerically in many places in rather an unusual degree. The stellate and substellate layers frequently exhibit bare spots or areas poorly provided with nerve cells, recalling the minor variations in cell supply found in senile cerebral atrophy. This process in the lower layers accompanied by tolerably well preserved upper layers gives a rather unusual total impression to the cortex.

To sum up, the cerebrum microscopically confirms the impressions of the gross and shows a mild chronic degeneration, characterized by subpial sulcal fibrillar gliosis and perivascular cellular gliosis, cell-atrophy with numerical losses in the stellate and substellate layers, besides more acute and recent processes (a mild focal leukencephalitis and congestion with leucocytosis of numerous veins).

Basal Ganglia.—The lesions under the lateral ventricles are old cysts of softening. The cleft-like spaces are filled with albumin coagulum and pigmented cells and are traversed by numerous small vessels. The walls of the cysts are composed of neuroglia fibrillæ which run for the most part parallel with the cyst borders and include numerous flattened nuclei. The picture changes gradually, so that the adjacent tissue, less than 0.5 mm. distant, shows a more active set of cells in which the cell bodies are symmetrically enlarged and centrosomes are demonstrable. The overlying ependyma is in places normal and shows the usual supply of superficial dots and occasionally a good demonstration of cilia. Upon approaching the deepest portion of the cleft now representing the caudate nucleus, the ependymal nuclei gradually accumulate to form a layer several deep, the superficial dots occur in more rounded collections, and the cilia fail to appear. In places the ependymal cells no longer maintain a compact arrangement, but occur in clumps and rings at a short distance from the membrane. In the latter case the cell-aggregations somewhat resemble giant cells; among the nuclei occur rounded collections

of dots which cannot be distinguished from the superficial dots of the ependymal membrane.

Cerebellum.—Cyst of Softening.³ The focal lesion in the cerebellum is an old cyst of softening. The smoothly undulating walls are composed of densely fibrillar neuroglia. The interior consists of numerous capillaries with loose fibrous coats and surrounding spaces which contain fibrin, albumin coagulum, and great numbers of swollen cells enclosing granular pigment. Similar cells are dotted throughout the wall in small spaces, which give the tissue a sieve-like appearance on cross section. The intrinsic glia cells in the cyst wall are few and inactive. The fibrils are fine and of even diameters, although where they abut upon or make out into the cyst they may become coarse agglutinated masses.

Some of the laminae of the cerebellum, especially the marginal gyri and the gyri around the cyst of softening, show a loss of substance which is peculiar. The contour and stratification of the affected laminae remain, but the component tissues have undergone a differential loss of substance. The nerve elements have disappeared. The white core contains no myelinated fibers. The Purkinje cells and their appertaining dendrites are absent. The layer of small nerve cells known as granules is represented only by a layer of neuroglia cells. The remnant of the inner or granule layer, with its dense feltwork of neuroglia, serves to maintain the contour and suggests the stratification of the normal cerebellar cortex. Radiating out from the modified inner layer are bundles of coarse neuroglia fibrils which, in situation at least, recall the fibers called Bergmann's fibers. Among these fibers there occur for wide areas no cell-bodies whatever. In many cases the bundles can be demonstrated to run all the way from the pia mater, where they may spread out to imitate a foot, to the neighborhood of the cells of the granule layer, which cells the fibrillae embrace in the characteristic fashion of neuroglia tissue. The nuclei of the cells related with these radial fibrillae are large, oval, vesicular, and provided with numerous chromatin dots; cell-bodies are rarely visible. Similar cells stand in similar relation to numerous finer fibrillae which run concentrically about as a kind of central beam for the granule layer. A third series of fine fibers runs at right angles to the two preceding, is derived from similar cells, and occupies the locus of the Purkinje cell layer. The tissue replacing the central core is composed of numerous fibrillae running in many directions, together with their cells of origin and a few vessels. In some laminae the impression is gained that fibers similar to Bergmann's fibers, or continuous with them, radiate inwards from the granule layer, but the core fibers are often so abundant as to obscure this picture.

Spinal Cord.—The cord of this case is a good field in which to

³ For plates, see Southard, *loc. cit.*

demonstrate the pure effects of old meningitis as opposed to the effects of secondary degenerations, since the meningitic process varies with some regularity down the cord, whereas the secondary degenerations in the long tracts persist throughout in maximal degree.

The meningitic process, as might be surmised from the clinical history, is severest in the thoracic region. Here, not only is there an extensive neuroglia thickening of the subpial region, together with a thickening of the pia mater, but also the dura mater is so firmly attached to the pia mater that the line of demarcation is sometimes hard to make out.

The condensing process which has gone on in these tissues was, at the time of autopsy, well-nigh at a standstill. Scattered lymphocytes (no plasma cells) lie in the meshes of the fibrous tissue, accompanied by old pigmented cells of endothelial type. Opposite the points of greatest condensation, namely, at the most prominent points in the lateral columns, there is no longer much evidence even of lymphocytosis, and here the tissue seems wholly quiescent. The effect of this lesion must have been to cut off intercommunication between subdural spaces above and below.

Examination of the cord itself at numerous levels shows that the brunt of the meningitic process is always borne by the most prominent portions of the lateral columns. Even at levels where there is little or no interadhesion of pia and dura mater, the neuroglia tissue is found to be most strengthened over the lateral columns. It is even probable that this peripheral gliosis, which was best demonstrable by Mallory's phosphotungstic acid hematein stain, is a more delicate sign of former reaction than is the pial thickening.

It seems difficult to explain why the peripheral gliosis should take maximal effect upon the lateral columns. In the present case the crossed pyramidal tract gliosis underlying this region may have contributed to local tissue tension, and therefore have aided the glia-formation. If this were the case, however, it might seem reasonable that the tabetiform lesion of the posterior columns should serve to deepen the glia-reaction over the posterior columns. As a matter of fact the peripheral gliosis of the posterior columns stands next in depth and density to that of the lateral columns, but is rarely if ever so severe.

Taken together, however, it is certain that the posterior columns, the posterior root zones, and the lateral columns (especially in the posterior two thirds) much outstrip the more anterior parts of the cord in severity of gliosis. There is also reason to think that the toxine or other agent at work to produce this gliosis is the same which is responsible for the lymphocytosis of these regions.

Lymphocyte-infiltration amounts at some levels to a mild myelitis. The most active region in this respect at the time of death

PROTRACTED CEREBROSPINAL SYPHILIS

was the cervical. Here, although no marked differences can be made out in the degree or quality of gliosis, it is evident that the perivascular infiltration prefers the above-mentioned regions of maximal gliosis and especially the posterior root zones. It is evident that this distribution of lesions would favor the occurrence of disorders of sensation and very probably the priority of these in the clinical history.

The signs of frank myelitis, aside from the gliotic reactions to destruction of long tracts and to meningitis, are few. The later clinical history had pointed to alterations of the state of the anterior horns. The gross examination of the cord at autopsy so far bore out this suspicion that minute cystic clefts and certain small whitish spots with brown borders were found in the anterior horns of the lumbar region. The small cystic clefts were rediscovered in microscopic section and proved to be of the banal type of dilated perivascular spaces, with which one is so familiar in the tissues of general paretics and of other organic cases. Into a few of these clefts there had been a slight extravasation of blood. No lesions corresponding with the above-mentioned white spots were found in the numerous segments studied; it is possible that they corresponded with local variations in gliosis combined with the results of minute hemorrhages.

At all events there is little evidence of frankly destructive myelitis of a focal character throughout the cord.

The manifold secondary degenerations in the cord require no further or special mention.

Cranial Nerves.—The clinical history, it will be remembered, showed sensory and motor disorders which varied markedly in their extent and were in some cases apparently cured only to recur once more; in some instances this alternation was repeated.

It seems *a priori* unlikely that such disorders can be due to focal losses of the type due to blockage of vessels. In case a given nerve is directly in an area of infarction, it seems unlikely that a repetition of symptoms would be brought about by a second process of infarction affecting the same nerve.

Far more likely is such a series of symptoms to be due to a meningitic process of possibly varying severity. Not only may the peripheral nerve involvement vary in severity in proportion to the intensity of meningitis about the superficial origins, but, in such a case as the present, the factor of peripheral subpial gliosis becomes of extreme importance. Moreover, in the case of certain nerves, like the optic and the seventh and eighth, neuroglia may overgrow within the nerves themselves and add to the possibilities of functional impairment.

From purely general considerations, therefore, it develops that in a case of basal meningitis an extensive series of factors can be responsible for functional disorder, viz.: (1) The edema and cellular exudation of an acute pial inflammation; (2) The con-

traction of the pial tissues in repair after inflammation; (3) The local acute neuroglia reaction (cellular gliosis) involving roots at the superficial origins; (4) The contraction of neuroglia tissue (fibrillar gliosis) about the emerging roots; (5) and (6) Acute and chronic gliosis within certain nerve roots themselves. (7) In addition to these factors, a case like the present, with extensive atrophy of interior tracts, may in the process of general contraction of the parts and the corset-like effect of advancing chronic meningitis, exhibit a curious herniation outward of nerve tissues through points of weakness in the surrounding pial tissues. The type of hernial gliosis due to compression from without is seen at its best in the compressed spinal cord, especially in a case like the present with extensive duro-pial adhesions.

It would be advisable to study these conditions in greater detail in a series of cases; but enough has been said to show that the histologist possesses a considerable gamut of reactive processes with which to explain a series of functional impairments in the same region.

It is naturally not easy at autopsy in a given case to assign dates to the different lesions shown. The hypothesis remains open always that a part of the phenomena were of a hysteroid nature superimposed upon the results of focal tissue losses.

Of especial interest in this case is the occurrence of factors (5) and (6) (of the above enumeration) in the cranial nerves of this case. Gliosis in the nerve origins may possibly account for the extreme irregularity of the atrophies observed (right third and sixth, left seventh and eighth, sensory root of left fifth). That these atrophies are in part of central or even nuclear origin cannot be denied. But the *focal and patchy character* of the lesions within the affected nerves themselves gives every hint of a local origin for a part of the phenomena.

The left eighth nerve was, on account of its size, especially studied in neuroglia preparations and shows a unilateral area of rather sharply marked fibrillar gliosis, recalling in some respects the appearance of an area of multiple sclerosis. But no appearances suggesting axis-cylinders can be made out in the area. In addition to this focus there is evidence of an exudative perineuritis (lymphocytosis).

REMARKS

It is interesting in the light of the above history and findings to consider what clinical moral is to be drawn for further guidance. It is obvious that amongst the many sorts of lesions that were present some remained susceptible of influence by treatment to the last, while others went slowly on their way.

In general terms, it might be said that most of the fresh symptoms, unless perhaps those of mental character, passed away, for

a time at least, under large doses of mercury and the iodides, and the histological investigation shows the reason for this favorable response. The question arises whether under the still more constant use of these remedies a wider and more permanent improvement would have been secured. It is quite possible that this would have been the case or that at any rate the occurrence of fresh outbreaks would have been forestalled and possibly prevented. Nevertheless, there seems to come a time when the power of mercury and iodides to secure benefits reaches its termination. To say the least, it is probable that there are some cases where it is impossible to bring about a complete immunity from further action of the syphilitic poison and it is obviously impossible to prevent the gradual impairment of the nutrition of the central nervous system through the formation of cicatrices and secondary degenerations. Nevertheless, in another case we should use these remedies at shorter intervals and if possible in larger doses.

A case observed by one of us during the past few years has lent special significance to this view. The patient, a man of middle age, was almost paralyzed from the neck down, when first seen in consultation, suffering from dyspnea and paresis of all four extremities, especially the legs, with highly exaggerated reflexes; all due, as the autopsy eventually showed, to lesions of the upper cervical cord. Under very large doses of potassium iodide, amounting finally to eight hundred grains a day, combined also with mercury, improvement set in and practical recovery followed. The treatment was continued for a long time but eventually was omitted. At the end of about a year or two of relatively good health, unfavorable signs of renewed outbreak in the same region again showed themselves, and the patient not then being under close observation did not at first receive adequate attention. When he was seen treatment was resumed and pushed, but he grew rapidly worse and died.

The autopsy showed a fresh gummatous formation in the cervical region of a kind that at an earlier period would probably have yielded rapidly to treatment. But in these late cases treatment, to be effective, has to be more vigorous than at earlier periods.

It is difficult to say whether certain of the improvements,—especially that in walking, when in 1902 vigorous treatment was

again resumed, but when likewise systematic training of the muscles was undertaken—were due to the anti-syphilitic treatment or to functional stimulation. It is likewise difficult to say whether the patient was suffering from a constitutional tendency to cerebral degeneration to which a portion of the mental symptoms might justly be referred and whether the extraordinary migrainoid attacks, which grew more protracted and more complex until the last year of the patient's life, had a portion of their origin in the lesions of syphilitic origin. It is notable that in the cases of patients liable to migraine, who suffer later from intra-cranial new growth, the headache due to the latter cause seems to be colored by the constitutional tendency, and a similar mixture of causal influences may have been present in this case. Certain it is that the hysterical tendencies of the patient made it very difficult for the physician to judge as to the exact character of the enemy with which he had to deal.

Perhaps the most important moral of all is that the time when the vigorous and prolonged anti-syphilitic treatment might have really killed the snake instead of only scotching it, was during the earlier portion of the illness, and that the temptation to regard the healing of ulcerations and the disappearance of acute symptoms as an indication for ceasing vigorous treatment is one that cannot too strongly be resisted.

One of the writers has recently seen a case of syphilitic meningo-myelitis which at first had been imperfectly treated, improve rapidly under more vigorous treatment, only to give place finally to a mild tabes, a result which a still more vigorous early treatment might possibly have obviated.

CONCLUSIONS

The very varied problems and considerations of this case may be set forth as follows:

1. A protracted case of cerebrospinal syphilis shows at the end of sixteen years after infection and eleven years after initial nerve symptoms, a multiplicity of chronic lesions, but shows few acute lesions save (*a*) lymphocytic exudation in the upper spinal cord segments (preferring the posterior root regions) and (*b*) certain interesting leukencephilitic foci in the brain. Possibly both (*a*) and (*b*) are related to intercurrent

infection from extensive decubitus; this is more likely in the case of (b). Search for spirochetæ so far negative.

2. On the basis of gross and histological findings, it is possible to correlate many of the various clinical features: (a) transverse myelitis, (b) intermittent cranial nerve and other symptoms, with structural disorder. But there were hysterical tendencies throughout which rendered exact correlations difficult *intra vitam*.

3. The intermittency of symptoms just mentioned (2 (b)) was most striking, and an enumeration of histological possibilities is given which might account for this intermittency (acute and reparative changes in the pia mater; cellular and fibrillar gliosis whether nuclear, periradicular, or, in some cases, intra-radicular; and the corset-like contraction of whole regions subject to sclerosis, with consequent herniation of small bits of nerve tissue).

4. The intermittency and varied structural origin of the symptoms, as well as the maintenance to the last of acute changes mentioned under (1) are reasons for optimism in pushing anti-syphilitic treatment.

5. Incidentally, the post-mortem data show how lumbar puncture might fail to reveal lymphocytes in cerebrospinal syphilis, provided that there is an occlusion of the intermeningeal space by adhesions above the point of puncture.

6. The case presented a kind of reversal of the biological tendency that the structures later evolved shall be destroyed first, since the course of lesions in this case was largely ascending throughout and the cerebral cortex was left at the last a species of shell from which the lower functioning mechanisms had been successively scooped out by disease.

PARALYSIS FOLLOWING RELAPSES AND SECOND ATTACKS OF DIPHTHERIA

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The following communication has been prompted by the perusal of the remarkable case, published by Dr. F. E. Coulter in this JOURNAL, of a second attack of general diphtheritic paralysis occurring after an interval of two years. In the present paper, which is based on personal observations made on 1,600 completed cases of diphtheria at the Grove Hospital, an artificial distinction has been made between relapses and second attacks. By a "relapse" is meant the re-appearance of the disease after recovery from the initial attack, but before the discharge of the patient from hospital. The term "second attack" is applied to cases in which the two illnesses did not occur during a single period of detention in hospital. In all the relapses and second attacks as well as in the primary disease, the clinical diagnosis received bacteriological confirmation, so as to exclude those cases of non-specific tonsillitis, which, as I have shown elsewhere, are not infrequent in convalescence from diphtheria. In the 1,600 cases 27, or 1.6 per cent., had relapses, which were separated from the initial angina by intervals ranging from three to fourteen weeks. The average date for their occurrence was about the middle of the sixth week. Two of the 27 had palatal and ocular palsies after the primary attack, but none showed any signs of paralysis after the relapse. Thirty-six, or 2.2 per cent., had second attacks, between which and the first there were intervals ranging from three months to fourteen years. The period of predilection was the first three years, during which 22 of the 36 took place. In 18 the first attack had occurred in the same hospital, so that their records were available. One of the cases had paralysis during the first attack only, and three had paralysis during the second illness who had previously escaped any nervous sequelæ. In only one case were both attacks followed by paralysis. This patient was a woman, aged

26, who was admitted to hospital in October, 1900, with mild faucial and nasal diphtheria. She had previously suffered several times from sore throat. No antitoxin was given, but only local treatment was employed. After removal to a convalescent hospital, palatal palsy, cycloplegia and loss of motor power in the lower limbs developed, necessitating her detention until February, 1901. She was admitted again in December, 1906, with a more severe angina than on the first occasion, on the third day of disease, when she received 12,000 units of antitoxin. Ciliary palsy developed on the thirty-second day, and lasted till the forty-fifth. No other paralysis occurred, and the knee and ankle jerks remained active during her forty-seven days' stay in hospital.

The value of early administration of antitoxin in preventing paralysis, especially of a severe character, has been illustrated experimentally by Rosenau and Anderson, and clinically by several observers, including myself. The entire absence of paralysis following a relapse was due to the fact that the disease arising in hospital could be jugulated at once by serumtherapy, so that in every case the throat symptoms were mild. In this connection I would insist on the fact universally accepted by the physicians of large fever hospitals, but contested by some neurologists, that the frequency and severity of diphtheritic paralysis bear a direct relation to the initial angina. The partial immunity conferred by the primary attack and the initial dose of antitoxin was the cause of none of the relapses displaying those features of malignancy which are manifested by severe local symptoms, deficient reaction to antitoxin and a high mortality, and are followed by a precocious paralysis, which in survivors is of unusually long duration. Second attacks, on the other hand, do not always run a mild course, since five such cases had severe local symptoms, and two developed paralysis, in one case fatal. It would seem that the immunity conferred by the first attack had been exhausted owing to the length of the interval which in these five cases ranged from one to three years.

The references in literature to the occurrence of second attacks of diphtheritic paralysis are very meager. The following which are arranged in chronological order are the only ones which I have been able to discover after a laborious search. It will be seen that there was usually a remarkable difference in the

extent of the paralysis following the two attacks, no repetition of generalized palsy having hitherto been recorded, so that Dr. Coulter's case may justly be called unique.

Lennox Browne's Case.—A woman, aged 40, the subject of chronic albuminuria, who had been a nurse in a fever hospital for eight years, had four attacks of diphtheria in the course of three years. In two attacks paralysis had developed, in the first "slight paresis" and diplopia, and in the last attack there was loss of power in the arm and both legs, as well as diplopia.

Stocker's Case.—A child had a severe primary attack followed by palatal palsy. The second attack eight years later was followed by palatal and ciliary palsy which lasted for several weeks.

Vucetic's Case.—A boy, aged 3 years, had a severe attack, which was treated with antitoxin and was followed by palatal palsy. On the fifty-sixth day there was a relapse which was more severe than the original attack. Palatal palsy again developed, but was not so severe as on the first occasion. Recovery finally took place.

Barbier's Case.—A boy had two attacks of diphtheria, the second eleven months after the first, both of which were followed by slight paresis of the lower limbs.

It is interesting to note that prior to the introduction of antitoxin in 1894 the majority of writers were of opinion that relapses and second attacks of diphtheria were frequent and were more severe than the first. Their greater severity can also be gauged retrospectively by the fact that they were more frequently followed by paralysis, as in the cases recorded by Gull, Burdon-Sanderson, Downes, Morell Mackenzie and Dobson. Since the general employment of antitoxin relapses have become rarer and as a rule milder than the primary attack, the statistics of all authorities showing a remarkable uniformity in placing their frequency at about one per cent.

The question raised by Dr. Coulter as to what result the introduction of antitoxin has had upon postdiphtheritic paralysis has been discussed by me at length elsewhere. The high incidence of paralysis which occurred among my own cases, as shown in Table I, is eloquent proof that palsies have not become less frequent since the introduction of serumtherapy. Their frequency has indeed increased, but this is due to the fact that many

cases survive to suffer paralysis who in former times died at an early stage of toxemia. On the other hand there is no doubt that the frequency of paralysis, as well as the case mortality, could be considerably reduced by the early administration of antitoxin. The truth of this statement is confirmed by the following table, which shows that of those injected on the first day of disease comparatively few develop paralysis, and in no case of a severe character. During each of the four subsequent days the frequency and severity of the paralysis cases increase.

TABLE I.

SHOWING RELATION OF PARALYSIS TO DAY OF DISEASE ON WHICH ANTITOXIN WAS INJECTED.

	Total Number Injected.	Paralysis Cases.	Percentage.	Severe Forms.	Percent- age.
1st day	62	3	4.8	0	0
2d day	335	54	16.1	14	4.1
3d day	384	81	21.09	32	8.3
4th day	321	95	29.5	39	12.1
5th day	214	68	31.7	36	16.8
6th day	103	32	31.06	17	16.5
7th day and later	120	28	23.3	10	8.3
	1539	361	23.4	148	9.6

Commenting on a similar table which I had compiled, a German opponent of antitoxin, Dr. Esch, recently objected that cases injected early could not properly be compared with those injected late, because the latter necessarily contained a much larger number of severe cases. To this I would answer, first, that in the great majority of my cases no local measures were employed to control the disease, and secondly, that in pre-antitoxin times early treatment had little effect upon the incidence of the paralysis. This is clearly shown in Table II, compiled by Woollacott, of cases treated at the Eastern Fever Hospital, London, in 1894, before the introduction of antitoxin.

TABLE II.

Day of Admission to Hospital.	Total Number of Cases.	Paralysis Cases.	Percentage of Paralysis.	Severe Paralysis.
First day	29	3	10.3	
Second day	100	12	12.0	2
Third day	106	10	9.4	2
Fourth day	73	4	5.4	
Fifth day and later	144	20	13.8	5
	452	49	10.8	9

The almost equal incidence of paralysis in early and late cases is due to the fact that the course of diphtheria in those days was but little affected by treatment, as Henoch and Cadet de Gassicourt, whose experience of the disease was considerable, testified long ago.

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THE SPASMODIC TYPE OF SYRINGOMYELIA

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Syringomyelia was divided by the great authority on this disease, Hermann Schlesinger, into six main types, namely, (a) typical syringomyelia, (b) motor, (c) sensory, (d) trophic, (e) tabetic, and (f) pachymeningitic syringomyelia.

In 1900 Dr. Pierre Marie presented and identified the first five cases of this type, and shortly afterwards his pupil, Guillain, wrote an elaborate thesis, giving a complete description of these same patients under the name of the spasmodic type of syringomyelia. In 1906, with Alquin and again with Raymond, Guillain added two more cases to the series, while Raymond with Francois reported the eighth example in the same year. Verger followed another case, which showed similar symptoms during life, to autopsy and records a central glioma as the actual pathological condition, while in 1908 Alexander Bruce in the *Review of Neurology*, wrote concerning a patient with some resemblance to Guillain's series, who may probably be regarded as either possessing the same or a related type of the disease.

In presenting this patient, whose symptoms correspond to the typical instances of Guillain, the different features of the case are each described, followed by immediate reference to the corresponding condition in the cases reported.

I. The most important characteristic of the spasmodic type of syringomyelia is undoubtedly what may be termed *the attitude of the patient*.

This little girl is sixteen years old and the disease has steadily advanced since the age of five, the slow progress being a feature of this condition.

As she stands up her deformity is apparent. The head slightly bent forward nestles between the strongly marked borders of the trapezii. The thorax, if viewed posteriorly, arching forward in its upper part, shows a marked concavity in its superior part in front, and this has been termed *thorax en bateau*.

The spine exhibits a most extreme degree of scoliosis, the curvature being to the left side.

The arms are drawn to the side of the body, the right, which

is at present the most affected, lying across the body with the hand towards the symphysis pubis, and exhibiting marked flexion at the elbow, a position in which it is rigidly fixed.

On the left side the elbow is already commencing to present the same signs, but is far less marked in rigidity than the right.

The shoulders are pushed forward and upward, slightly rotated inward.

Contrasting this attitude with that described by Guillain one notes the similarity in all respects as regards head, shoulders, thorax en bateau and position of the arms. Also the unilateral advance was present in four of his five cases, while the scoliosis was marked in one and present in four others.

II. Turning from the attitude of the patient to the minute study of the arms, emphasis must be laid on the characteristic position at each joint on the right side.

1. The shoulder raised by the trapezius pushed forward on the thorax and rotated slightly in by the pectoralis.

2. The elbow in a state of rigid flexion, although if the joint is still further flexed then some extension is possible.

3. A most important sign at the wrist, namely, *hyper-extension of the hand on the forearm*, which will be referred to again.

4. The position of the fingers, namely, the three inner, flexed firmly into the hand, while the fourth finger shows incomplete flexion; this being most marked at the terminal phalanx, and with the thumb, which is adducted, forming a position described as a "pair of pincers."

These striking points are the main diagnostic signs of the disease together with those already referred to under the general attitude of the patient, and they are reported in all the definite cases of the disease and may be said to be invariably the same.

True, the exact position of the fingers may show some alteration due to the period and advance of the disease, so that this may be described as the typical position, and in a more advanced case one may expect to find more marked flexion of the fingers, in which the index will be included, as is well shown in one case of Guillain's. This *hand* has been present in the cases examined post-mortem, and is characteristic of syringomyelia spasmodique, and while it might possibly be present in pachymeningitis, yet to the present time it is diagnostic of the former disease.

The hyper-extended wrist is also striking and equally important, and it may be produced by syringomyelia and conditions copying this, as glioma, pachymeningitis, and by acute poliomyelitis.

It is easily distinguished from the common cerebral type of hand seen in diplegia, or hydrocephalus, in which marked flexion frequently is found.

III. Considering now the muscular power of the right arm, movement at the shoulder is limited; elevation is possible, but

adduction and abduction are very weak, while no power of rotation is present. At the elbow a very small extent of flexion and extension is possible, and, strange to say, if the power is tried, despite the contracted condition of the biceps, yet the extension of the triceps is greater than the biceps power, and if the arm be still more flexed it is noticeable that the extension is the stronger, so that the muscle in contraction is weaker than the muscle which has given way. The same fact applies to the other arm.

At the wrist slight extension and flexion are possible, and here the contracted extensors are more powerful than the flexors of the reverse condition to that in the upper arm.

The last three fingers can be flexed to a certain degree and partially extended; the first finger to a greater extent, and the adducted thumb also to a certain degree.

But the characteristic pincer movement is better shown by the less involved hand, as the right while presenting the same position has passed into a condition of rigidity where the movement of the thumb is difficult.

In Guillain's series the muscular power varied according to the extent and stage of the disease, but he also lays stress on the fact that it is the spastic and rigid condition far more than the atrophic condition which causes the loss of power.

IV. The trophic condition of the muscles is such that no actual wasting of any group of muscles, beyond disuse wasting, can be made out, and the condition conforms to an upper rather than a lower motor condition. True, the biceps is in a peculiar contracted condition and the triceps is extremely small, and the extensors appear wasted, but there is no valid proof that such is the case, with the exception that I have observed fibrillation of the left triceps, and this is characteristic of a lower motor neurone disease.

But to offset this important point it must be stated that despite the equally spastic condition of the legs, yet there is no corresponding atrophic condition there, and they look large and well nourished, although one must bear in mind that the affection is much more recent.

Secondly, it is necessary to add that the cases described by Guillain showed the same positions of the upper extremity, and he claims that such is always a sign of local lesion in the cervical region of the cord and is produced by local processes only.

Thirdly, it appears to me to be characteristic of a type of syringomyelia to have atrophic muscles present with much diminished muscular power; without demonstrable wasting of a lower motor neurone type, and by that I mean for instance with interosseal paralysis without markedly hollowed out spaces between the bones, and with electrical reactions which are not typical of degeneration.

The explanation must be that in this disease either certain

fibers of a muscle waste and those remaining give the electrical reaction, or else there must be a situation between the pyramidal tract and the nerve cells of the muscles, whose destruction causes the spasticity of the first and the peculiar wasting of this type of case without changed electrical reactions.

Guillain's cases evidently were of the same type, for with the same advanced condition of paralysis he only describes actual wasting in a few muscle groups, usually the small muscles of the hand or isolated forearm groups, although late in the disease more marked atrophy occurs.

This condition of spasticity and rigidity with moderate wasting, and with no reaction of degeneration, in a disease making very slow advance, negatives the diagnosis of amyotrophic lateral sclerosis, and may be said to be decidedly characteristic of syringomyelia of this particular type.

V. The electrical reactions are most interesting, for all muscles react to faradism and to galvanism.

There is no polar change and no sluggish contraction, and, in fact, the muscles reacted to a current that was approximately normal.

In no case did the authority prove any R. D., even when marked wasting was present, although a stronger faradic current was required for some of the more advanced muscles or when there was definite atrophy.

VI. The condition of the left arm will not be described, except to say that it is beginning to show in an early condition the same tendencies as the right. The elbow contraction is already present and adhesions at the joint are easily broken down. The hand shows the typical three-finger flexion and pincer position of the first two digits, and the wrist is commencing to show the extension position. Fibrillation has been observed in the triceps.

VII. The muscles of the back must be extremely weak since the scoliosis is so marked, but the abdominal muscles are apparently normal.

VIII. The lower limbs are well nourished and are spastic and rigid, particularly at the knees and ankles. There is no wasting. Movements are possible at all joints, no fibrillation is visible.

The gait is rather that of a double hemiplegic movement, taking place from the spine and sacro-iliac joints by rotation.

Such a gait is perhaps more typical of a syphilitic pachymeningitis, but the scoliosis, the anesthesia, the age, the slow advance of lesion, the arm position and the height of the lesion, together with the absence of cerebral specific manifestations negative that diagnosis. The more marked affection of both pyramidal tracts would also explain its presence here.

IX. The reflexes are as follows: Eyes normal. Jaw jerk present. Biceps present, left slightly greater than right. Triceps present, left slightly greater than right, probably due to extreme rigidity of the right side.

Knee joints both increased. Ankle clonus present and double extensor plantar responses, *right more marked than left*.

In the reported cases the reflexes of the lower limbs have been increased in some cases and decreased in others, while those of the upper limbs were absent in three cases and increased in one.

X. The bladder and rectum are at present normal; there was a period when micturition required to be performed more frequently, but she has recovered from this. The bladder is frequently affected in the later stages, as the patient may suffer from incontinence and from cystitis due to trophic disturbances, such as trophic abscess and bleeding.

XI. *Sensation*.—In Guillain's groups four of the cases gave syringomyelic areas, although in one case he had difficulty apparently in making out temperature sensations, which were more markedly defective as regards heat.

In the fifth case, early in the disease no sensory impairment was noted beyond slight anesthesia in the upper part of one thigh. Before death, 21 years later, touch, though retarded, was normal except over the left hand.

Pain was lost over some part of the body and retarded generally. Temperature over the whole body was either interpreted as touch or more frequently as cold.

Turning to this patient one may state that correct judgment of anesthetic areas is difficult, as the child is a foreigner. There is much retardation, particularly in certain areas, and especially of temperature.

No tactile anesthesia was made out.

Analgesia was also absent, though there was an area on the right thigh where it apparently was doubtfully present.

But to temperature sensation much importance is due, as while cold seemed everywhere present, and no definite mistake was made, yet heat, as in Guillain's case, was affected.

Frequently heat was termed cold, at other times touch, and this all over the body; while on another test the mistake was rectified in places, not in others. An extension of the area stimulated in certain cases produced a correct reply.

On the right side one error was practically constant, namely, below the waist, above the thigh; heat was termed touch, but in passing upward gradually it was called cold, while above the nipple it was recognized as heat. If the temperature was raised to a higher point the test was less successful and the reply might be correct.

On the left side the same phenomena occurred, but less clearly. Finally, to a faradic current, the right side was claimed to be more sensitive than the left from the mid line.

Two features require impression here, as they are of great value in these syringomyelic cases: (1) The retardation of sensation; (2) the non recognition of heat as such, but its perception

without temperature association as touch or otherwise as cold. (3) One may note that in early cases sensation may be normal, that temperature disassociation may appear first, and that beyond a difficulty in distinguishing heat as such, that no definitely bounded area may be involved, and that retardation may be a distinctive character.

XII. No trophic areas have been discovered, except a large burn scar on the arm and one on the leg, from which no conclusion could be drawn. In Guillain's group whitlows were present in some cases.

XIII. The cranial nerves are normal, with the exception that an undulating movement is present on the tongue, which may be abnormal. It is interesting to note that the same condition, an undulation, not a fibrillation, is quoted in one other case. Some of the other patients have had cranial nerve signs, as wasting of the tongue, etc., though they are uncommon.

The mental condition is absolutely normal and unusually bright and clear.

XIV. Regarding the diagnosis, it is unnecessary to expand, as each possible case has been referred to as corresponding signs appeared—taking the attitude, the arm condition, the scoliosis, the spastic legs, the fibrillation, the normal electrical reaction, and the irregular disturbances of sensation. There are the two diseases which remain to be differentiated, namely, syringomyelia and pachymeningitis cervicalis. Guillain believes their separation in most cases is impossible, as either by themselves or together they may lead to a similar set of signs. But in this case the marked scoliosis, and the leg condition with the absence of definite atrophic wasting, all point to the correctness of the disease being a definite case of the spasmodic type of syringomyelia.

XV. In conclusion, let the history end where most commence, namely, with the course. It began at the age of five and she is now sixteen. Pain in the back of the head and the curving of the spine were together the earliest signs, and one of Guillain's cases which went to autopsy commenced with the same pain. These disappeared in the girl's case. Gradually at the age of six the arm began to be affected and she complained of difficulty in moving it. The legs were attacked at about ten years of age and the right arm has only shown any affection for three years. For the last year there has been slight difficulty in micturition.

Society Proceedings

CHICAGO NEUROLOGICAL SOCIETY

October 21, 1909

The President, DR. L. HARRISON METTLER, in the Chair

PRESENTATION OF THREE BRAIN CASES

By D'Orsay Hecht, M.D.

Case 1. Brain Tumor at the Base in the Region of the Pons, Single or Multiple.—Dr. D'Orsay Hecht presented Miss J. McM., a young lady, aged 21, single, and a recent high school graduate, whose family history was not entirely unimportant, since the father had died of a heart lesion at 54, one brother was at present in Texas with pulmonary trouble, one sister died at the age of two from a cause unknown, and another brother had some paralytic disturbance in the legs. The mother was living and well at 54, and had had one miscarriage. The patient's past history was uneventful. Although never robust, she had graduated from grammar school in good health, was very well during her first and second years at high school, but in the latter part of her third year became nervous and easily fatigued. During her fourth year, that is, one year ago, owing to the surplus of work required of her, she became nervous, sleepless, irritable, and during her menses had to remain at home for a day or more. Her class record for her last year was not equal to that of previous years. She gave evidence of lack of concentration both at home and in school. Her eyes felt weak and tired and as the rest during the summer months did not seem to improve her general condition, she consulted an oculist in August, 1908. Glasses were prescribed, which seemed somewhat to improve her. In 1909 she contracted a severe cold, complained of some earache and defective hearing on the right side. Removal of hardened cerumen influenced neither the pain nor hearing. At this time her teeth hurt her, and with the gradually increasing discomfort in the face and jaw of the right side she consulted an osteopath in April, 1909. A few months' treatment followed, with no improvement. The hyperesthesia of her face, especially on the right side, gave way to numbness, although occasional neuralgic pains of great severity continued. Use of the eyes caused the head to ache. On June 14, 1909, she complained of seeing double for the first time, and consulted another oculist, who stated that the muscle of the eye was paralyzed, but afforded her no relief.

Dr. Hecht saw her for the first time on July 7, 1909, when the patient's chief complaints were diplopia; greatly impaired mastication; severe head pain, diffuse, radiating to the nape of the neck and into the right shoulder; marked insomnia and general irritability. Examination revealed right external rectus palsy; a weak bite on the right side, with notable flaccidity of the mandibular muscles; analgesia of the right half

of the face, including buccal mucous membrane, nasal mucosa and anterior two-thirds of the right half of the tongue, which also lay in folds and had the appearance of beginning hemiatrophy; inequality of the pupils, the left being considerably the larger, with normal pupillary reaction; fundi that showed no change. Tongue deflected quite markedly to the right.

The patient was referred to Dr. Mortimer Frank, whose notes of the examination were presented, as follows:

In the fall of 1908 patient was given glasses, and when seen by Dr. Frank was wearing, o.u., $+0.25 + 0.25 \times 90$. About one and one-half to two months previous to examination she was complaining of double vision and was cross-eyed at the same time.

August 3, 1909. The right pupil was 5 millimeters; left pupil, $2\frac{1}{2}$ millimeters. The right vision was $6/15 +$, and the left $6/9 +$. There was a paralysis of the right external rectus. The pupils reacted to light, both direct and consensual, and to accommodation. Convergence was intact. The head was turned towards the right side. Fundus examination showed the nerve heads whiter than usually found; otherwise the fundus looked normal. She was refracted under homatropine and cocaine and she accepted in the right eye $+0.50 + 0.50 \times 90$ $6/9 +$; left eye $+0.75 + 0.50 \times 90$ $6/9 -$.

The viscera, the motor and sensory apparatus, together with the deep and superficial reflexes, were negative. The patient was seen on several occasions, when the above findings, taken at date of first examination, could be verified. There was noted from the first a soft bilaterally enlarged thyroid.

On September 11, 1909, the headaches had become so severe as to prevent the patient from lying down. They were most intense when lying on the right side. The head discomfort soon became so acute as to compel sleep in a sitting posture. Neither nausea nor vomiting had occurred at any time. Eating was a great effort. The patient's generally reduced condition made hospital care advisable, and Miss McM. entered the service of Dr. Hecht at the Michael Reese Hospital, on September 26. The clinical record shows an afternoon rise of temperature taken in the right and left axilla respectively of 99°F ., with no difference as to sides. All symptoms noted at date of earlier examination continued and deepened, particularly those relating to the trigeminus. The tongue also deviated more to the right; the soft palate and uvula lagged on the right side of the pharynx upon intonation of the vowel *a*, the muscles of the left side drawing markedly in the opposite direction. Toward the end of the patient's stay in the hospital fluids regurgitated through the nose and swallowing became so difficult that the patient was disinclined to eat in the presence of others.

On October 1 the conjunctival and corneal reflexes in the right eye were lost, and on October 8 corneal anesthesia was so profound as to admit of wiping the eyeball with a handkerchief. The notes of record taken October 5 showed the jaw-jerk absent, the left triceps more brisk than the right, the left wrist tap more brisk than the right, the abdominal skin reflexes equally brisk, the knee-jerks—tested in both recumbent and sitting postures—present, the left more brisk than the right, the Achilles both present and equally brisk, the plantars reduced, the Babinski absent. This contralateral increase in the tendon reflexes was thus noted for the first time after many examinations.

An ear examination made by Dr. Ira Frank showed:

Both membranes markedly retracted. Right reflex absent. Bezold tuning fork test. Right ear: The area conduction was eight seconds; the bone conduction, 17 seconds; high limit normal; low limit, *a*. Left ear: The area conduction was 54 seconds, and the osseous conduction, 14 seconds; high limit normal; low limit, *G2*.

The Weber test. Right ear: Schwabacher, 30 seconds. Before catheterization the distance for conversation with numbers was five feet, and whispered voice, one foot. No improvement after catheterization. It was impossible to catheterize the tube on account of the closure. On passing the catheter through the right nostril there seemed to be a complete anesthesia. Larynx normal.

The laboratory data were as follows: Wassermann test with the blood negative. Noguchi test with the cerebro-spinal fluid negative. Urinalysis negative. Blood examination revealed 4,944,000 reds, 7,800 whites, 94 per cent. of which were polymorphonuclear cells. Hemoglobin 90 per cent. Radiographs of the head in anteroposterior and lateral aspects were negative. On October 11 there was noted a muco-purulent discharge from the right eye with marked conjunctival hyperemia which in the course of two weeks treatment with argyrol subsided. On October 15 right ptosis was noted for the first time. By the time of the discharge of the patient on October 28 there was almost complete drooping of the lip. The treatment has been palliative for the sleeplessness; a course of antisyphilitic treatment has proven inert. In closing the presentation of this case Dr. Hecht submitted a charting of the visual fields for form and color taken by Dr. Frank, which showed in slight degree a contraction and interlacing of the color fields. In this comment upon this case which involved in great extent the third, fifth, sixth, seventh and doubtfully the eighth cranial nerves on the right side, together with very obvious symptoms of increased intracranial pressure, except the fundus findings, which remained constantly normal, Dr. Hecht thought a diagnosis of neoplasm at the base, in the region of the pons, was justified. Whether or not the lesion was single or multiple he was not prepared to say. The appearance latterly of exaggeration of the reflexes on the side of the body opposite to that of the cranial nerve involvement would, he thought, have importance only as a secondary, indirect pressure focal finding. He had thought of tubercle or tubercles in this region. The rapid advance of the symptoms would predicate an early termination of the case, which he hoped to follow to its end, and probably at a later time would be able to report upon an autopsy.

Case 2. Dr. Hecht Presented as His Second Case a Patient Presenting Brain Tumor Symptoms of Long Standing, not Localizable.—Mrs. R. C. H., aged 23, married seven years, mother of a child, four and one-half years of age; had miscarried her first pregnancy at five and one-half months, and her third at three and one-half months. Both the family and past histories were uneventful. The patient had been referred to Dr. Hecht with symptoms pointing to hysteria and neurasthenia. Upon inquiry, it was ascertained that headaches, more or less confined to the temporal region, had appeared three years ago and chiefly at the time of the menstrual period. For the past two years they had been almost constant, very severe, particularly acute in either temple, also at the back of the neck. With the headache there had come easy fatigue and much crying without adequate provocation. The emotional aspects of the case

had been so much in the foreground as to lead to the inference of a functional disturbance. Six months ago, blurring upon reading was noticed for the first time. An oculist who was consulted prescribed glasses, which did not improve vision. A second oculist later found abnormal fundi, but did not intimate to the patient the possibilities of organic disease. The feeling in the head is characterized as one of "awful misery," the pain becoming so intense at times as to cause a sense of stiffness whenever the head is turned in marked right or left direction. Occasionally there is a feeling as if something would burst in the right ear. Slight vertigo has been present at times when the headache was very severe. Nausea and vomiting have never been present. The patient is much depressed, worries a great deal, and cries much.

For brevity's sake, Dr. Hecht would say that the physical examination revealed symptoms solely referable to the fundi. The viscera and nervous system, both motor and sensory, were negative, and the cranial nerves were intact. The pupils were large and widely dilated, reacting promptly to light and accommodation. They were equal, nearly regular in outline; there was neither ocular palsy, nystagmus nor hemianopsia. The fundi showed distinctly an optic neuritis more advanced in the right nerve than in the left. He desired to submit the fundus findings, kindly taken for him by Dr. Mortimer Frank, together with the fields for form and color, which showed in the right eye considerable narrowing and some interlacing as well. He desired to add that two radiograms taken by Dr. O'Donnell, at the Michael Reese Hospital, with a view to establishing some deformation of the sella turcica, were negative. Antispecific treatment had been entirely without result. The urine was negative. The patient had been observed for a period of almost eight weeks, without the least change in any of the findings.

Dr. Hecht thought the case most interesting from the standpoint of the long duration of the headaches—almost three years, pointing to intracranial pressure, together with the sole finding referable to the fundi. He would add that the occasional remissions in the headache which the patient thought she could bear witness to, spoke somewhat for an internal hydrocephalus, without necessarily associated neoplasm. The interlacing of the color fields he suggested might have some importance in this case as an early diagnostic sign of brain tumor, but he was disposed to admit that due allowance must be made in all cases where the fields are taken, because of the difference in light, the difference in the degrees of concentration which various patients show, their accuracy in answer, and their intellect on the whole. With these symptoms at once significant and yet meager, cerebral syphilis and cerebellar tumor must be admitted as diagnostic possibilities. The former had been excluded since not the least change had been brought about by very adequate antisyphilitic treatment. As for cerebellar neoplasm, with its known tendency to early developing papillitis, only the subsequent course of the symptoms could point with positiveness to this area.

Case 3. Case Presenting Symptoms of Intracranial Pressure of Tumor or Toxic Origin.—Mrs. R. H., a married woman, 25 years of age, who in the three years of married life had had two children and no miscarriages. Family and past history unimportant. The patient, when first seen, was nursing her youngest, of five months. In April, 1909, she experienced a sense of numbness in the right fingers, ascending the right arm, involving the shoulder, and extending to the right half of the face.

down on to the thorax, in a mid-line, and curving under the right breast, stopping at about the waist line. This paresthesia was present for short periods, once or twice a week, for about one month. In May or early June, a very transitory weakness in the grasp of the right hand appeared, noticeable particularly when the patient put the right hand to the left breast in the course of feeding her infant. Only on two occasions was this feeling of weakness and clumsiness manifest during the month. In July, one month after the weakness and three months after the first paresthesias, a right hemicrania appeared, also inconstant, rather severe, and at times attended with retching and vomiting, particularly when the head was raised from the pillow in the morning. Two weeks prior to her seeing Dr. Hecht, that is, in July, patient had visited some dispensary for the correction of vision in the right eye. She received rather indifferent treatment, and subsequently saw his colleague, Dr. Mortimer Frank, who kindly referred her to Dr. Hecht for corroborative evidence of a brain tumor, already indicated to him by the presence of an intense papillitis in the right eye.

After a cursory examination at the office, which was conspicuous for its negative results, the patient was referred to Dr. Hecht's service at the Michael Reese Hospital, July 20, 1909. The hospital laboratory data are as follows:

Blood count: White corpuscles, 7,400; reds, 4,072,000; hemoglobin, 80 per cent. Urine: Acid; specific gravity, 1.060; albumin, a very faint trace; sugar present; acetone, a faint trace. A second analysis of a twenty-four hour specimen, made on the following day, showed a faintly alkaline reaction; specific gravity of 1.050; urea, 3 per cent.; albumin, a very faint trace; sugar present, 3.11 per cent.; acetone, a very faint trace, and no diacetic acid.

With the patient immediately placed upon a von Noorden diet, the urine soon showed an atypical reduction, and within a week, as the result of carbohydrate-free diet, binding of the breasts, and catharsis, thus terminating the lactational period, the sugar elements in the urine disappeared, not to return. Occasional hyaline and granular casts were observed, and these, too, disappeared from the daily analyses in the course of two weeks. The Wasserman test was negative, and upon cytologic examination the spinal fluid showed small mononuclears, 90 per cent.; polymorph neutrophils, 1 per cent.; endothelial cells, 0 per cent.; and a positive Noguchi.

Radiograms taken in both antero-posterior and lateral views, were negative. Von Pirquet was also negative. The sinuses were examined by Dr. Morgenthau, and found negative. Upon ophthalmoscopic examination, the fundus was intensely swollen and edematous, so much so that the ordinary red reflex was absent and in its stead appeared a white watery-looking field, the nerve head having the appearance of being capped by a large water blister. Vision in that eye was completely absent. The patient was repeatedly examined and after the first week the fundal swelling began to subside, as did the headaches and slight vertigo. Vision began to improve about August 1 and the patient soon thereafter was discharged from the hospital but had been seen at regular intervals since, having been examined the last time on October 19, when the disc outline could be seen with fair distinctness as well as the vessels and their bifurcation. The normal pinkish color of the disc had reappeared and on the nasal side there was now a very well defined patch of beginning atrophy. Vision was fair in that eye.

In commenting upon this case Dr. Hecht drew attention to the immense importance of collecting all the clinical and laboratory data before arriving at an opinion. The finding of sugar had been a complete surprise. The unilaterality of the papillitis, the prompt subsidence of all subjective symptoms and physical signs after introducing appropriate treatment to interrupt the lactational period had, it seemed, taken this case out of the realm of brain tumor and placed it with that group—but rarely seen and not at all well understood—the optic neuritides of toxic origin, in this case lactational.

Uthoff has reported a few such cases and Dr. Hecht was able to find an American reference made by Dr. Green of St. Louis in a single case report. In closing, Dr. Hecht said that the patient as presented was entirely free from any of the signs or symptoms of brain tumor and except for partially defective vision in the right eye felt as well as he ever did.

Dr. Brown Pusey pointed out that in taking fields of vision one can get a patient to vary so greatly that he would not attach a great deal of importance to the interlacing shown in one of the charts. He examined the fundi of the two patients shown, and in the second case, the one with the non-localizable lesion, found a fairly distinct papillitis on the right side, and not so marked papillitis on the left side.

Dr. Julius Grinker rather doubted the diagnosis of a lactation toxemia in the third case, because of a similar case seen by him in a man, forty-five years old, who presented paresthesia and symptoms of paresis on the right side, with a slight degree of aphasia. He had, in addition, what appeared to be a rudimentary type of Jacksonian epilepsy. There was a distinct blurring of the discs and a prominent neurologist diagnosed the case as one of brain tumor. Finding a trace of sugar in the urine, he was led to modify the diet, and the Jacksonian fits did not return. All the symptoms disappeared, the fundus picture changed, and after a year there had been no return of any symptom. Codein was also given regularly for several weeks. The patient had a marked degree of angiosclerosis. He explained the Jacksonian fits and the paresthesia as being due to the angiosclerosis, which diabetes is known to produce.

With regard to the first case, he thought that the symptoms pointed to one or more tumors situated in the posterior corpora quadrigemina and in the pons. The absence of optic neuritis is often seen in pons tumor. The case, he thought, was an inoperable one.

Dr. Hecht agreed with Dr. Pusey as to the relative value of interlacing fields, owing to the difference in patients and the different circumstances under which they are seen. He merely called attention to this fact because of the decided impetus which this finding has received through the recent writings of Cushing and Bordley. These fields suggest the possibility of brain tumor, and do not leave the case in the realm of the functional disturbances. In the third case the blood pressure was taken on two occasions, and was 100 and 130 respectively. The case was interesting because of the fundus findings and the disappearance of all symptoms referable to brain tumor, following the disappearance of the glycosuria and the drying up of the breasts. As to placing the case on a diabetic basis, there was nothing in the retina that could be associated with the picture so frequently seen in diabetes. The appearance of sugar in the urine during lactation is by no means infrequent.

As to the first case, he was convinced of the existence of a tumor

in the posterior fossa, and that it was in close proximity to the pons. The question of one or of more than one tumor was pertinent, but, single or multiple, it surely was inoperable. So far as the absence of the eye findings is concerned, that merely substantiates the location of the tumor. Optic neuritis is a rare and improbable symptom in a case of tumor in this locality.

PRESENTATION OF PATIENT PREVIOUSLY SHOWN AS A CASE OF UNILATERAL PARALYTIC CHOREA

By Julius Grinker, M.D.

Dr. Julius Grinker presented a patient previously shown as a case of unilateral paralytic chorea. The boy, normal in every way, with a negative family and personal history, was kicked in the region of the right ankle in 1905. A slight swelling which appeared subsided promptly under massage. In a few days a weakness developed in the right lower extremity and extended upward until in a few days more it involved the right half of the body. The boy became clumsy in his movement and refused to use his right arm. When seen first by Dr. Grinker, in January, 1906, the case resembled one of right hemiplegia. The face, however, did not show any paralysis. The pupils reacted equally to light and accommodation; the reflexes were normal on both sides, except a diminution in the right knee and Achilles jerks. There was no Babinski. A few weeks later irregular movements developed in the hand and arm, which lasted for some months. These were so marked that the case was regarded as one of unilateral paralytic chorea. When the arm was at rest, the movements were not noticeable. Under treatment the boy improved, so that he could use both arms and legs, but after a few months there was a return of the irregular twitching and tremor-like movements. He persistently refused to use his right hand. There was no atrophy, and absolutely no sensory disturbance. About a year later there was a very exaggerated knee-jerk, and ankle clonus, and a typical Babinski on the right side. The movements in the hand resembled the intention tremor of multiple sclerosis. The boy could not use the right hand for anything requiring coördination. He continued to limp, but otherwise was well. This condition has continued uninterruptedly and in a unilateral fashion. Dr. Grinker is convinced that now it is a case of multiple sclerosis limited to one-half of the body. The abdominal reflexes are present; the eyes are negative in every way; speech is somewhat affected.

Dr. D'Orsay Hecht said that he had regarded the case when first shown as one of hysteria. As for the appearance of the case now, if it occurred in an adult he would certainly say that there are some grounds for calling it a case of multiple sclerosis, but he did not feel disposed to make such a diagnosis under the existing age incidence. Nor did he feel like suggesting any diagnosis because the only symptom indicative of disseminated sclerosis is an intention tremor, which, in truth, had more the appearance of ataxia. He suggested that the case might develop further symptoms which would lead to more than a presumptive diagnosis in time.

Dr. Grinker reiterated that the boy now appeared to be suffering from a unilateral multiple sclerosis, and that the fact that he is only a child did not militate against such a diagnosis. The boy's speech is rather peculiar, not exactly scanning, but explosive at times.

PRESENTATION OF BRAIN WITH MULTIPLE TUBERCLES

By Julius Grinker, M.D.

Dr. Grinker presented a brain with multiple solitary tubercles from a man, 47 years old, with a negative family and personal history. About Christmas, 1908, he had a severe attack of grippe, following which he began to get drowsy and his lids refused to open, especially the right one. His eyes turned up and when he attempted to look down he occasionally saw double. He had continuous headaches, varying in severity, however. In April or May, 1909, vision became blurred and he developed mental symptoms. He could not remember things and could not concentrate his attention. The ptosis at this time was variable, and was never complete. It seemed to consist of a mere weakness of the levator muscle. The reflexes were slightly exaggerated; the discs appeared to be slightly blurred, but Dr. Casey Wood, who kindly referred the case, is certain that there was no choked disc. No other cranial nerves were involved. Upward rotation of the eye on one side seemed to be slightly limited. The patient appeared to be confused. There was a slight Romberg. Dr. Grinker decided that it was a case of deep-seated tumor, and advised a decompression operation after Cushing's method. This was performed and the patient died within a week.

At the post-mortem there was found a tumor of the inferior corpora quadrigemina, a small tumor in the frontal lobe, and another in the median convolution. The location of the tumor in the corpora quadrigemina explained the eye symptoms present in this case, the frontal tumor, the mental dulness.

A CASE OF SPINAL SYPHILIS APPROACHING THE BROWN-SÉQUARD TYPE.

By Geo. W. Hall, M.D.

A man 30 years old was admitted to the Cook County Hospital on July 7, 1909, complaining of pain between the shoulders, of three weeks duration. Some numbness, involving especially the right leg and the ulnar regions of both arms. On the right side the numbness commenced two or three inches above the level of the umbilicus and involved the entire lower extremity. The patient was constipated; had no headache or dizziness, he could not walk without a cane. The symptoms had existed for three weeks and were steadily increasing in severity. Four years ago the patient had a chancre, but did not consult a physician. Secondary symptoms were uncertain. The temperature was not increased at any time while the patient was under Dr. Hall's care. There was no flushing of the skin and no external evidence of discomfort. The left palpebral fissure was smaller than the right. The right pupil was normal, the left one smaller than the right and reacted sluggishly to light. The fundus findings were normal. Examination of the lungs, heart and spleen was negative. No tender spots and no deformity except a slight prominence of the spine in the region of the first dorsal vertebra. Both knee reflexes were exaggerated; left ankle clonus and positive Babinski sign; cremaster reflex brisk. As stated, the numbness was more marked in the right side; the left leg seemed to be hyperesthetic, the right one anesthetic. Tactile and muscle sense present on both sides, but loss of

pain and temperature senses in the right leg. There was no impairment of speech. Wasserman test by Dr. F. G. Harris was positive. The patient was placed on anti-syphilitic treatment with rather rapid improvement. There is still a decided disturbance of pain and temperature senses on the right side, but tactile and muscle senses are normal. A peculiar feature in the case was the fact that the patient perspired only on the right side of the face and had slight ptosis of the left eyelid and narrowing of the left pupil due to involvement of the sympathetic supply on that side.

PHILADELPHIA NEUROLOGICAL SOCIETY

November 26, 1909

The President, DR. T. H. WEISENBURG, in the Chair

Dr. F. X. Dercum reported a case of juvenile paresis.

Dr. Richardson said that he had reported a case of juvenile paresis before the Psychiatric Society last March. It was the only case he had encountered during the past three years at Norristown. The patient was admitted at the age of 24½ years, the mental symptoms having been noticed first some two years earlier. The patient lived less than two months after admission. The picture was that of the simple demented form of paresis, far advanced, and with no remarkable features. The boy had done fairly well in school, was a good pianist but had never been able to earn more than six dollars per week and at simple occupations. The history of syphilis could not be absolutely established in the parents but as the mother is at present suffering from advanced tabes of twelve years' standing, and as she bore only the one child (one year after marriage) followed by six stillbirths, there can be little question that she contracted syphilis at or about the time of the conception of the patient. Syphilis could not be demonstrated in the father, neither could it be entirely excluded. The patient died in general convulsions lasting twenty-four hours, but unfortunately, efforts to obtain an autopsy proved unavailing.

Dr. David Riesman reported a case of postpuerperal febrile mania of long duration, ending in recovery.

Dr. Dercum said that he had seen Dr. Riesman's patient a number of times, and had always been confident of a favorable outcome, provided her strength could be maintained. He was of the opinion that the infection called hypermania is very different from mania proper, and differs radically from the mania associated with other phases of the maniac-depressive group. It is an excitement attended with a great degree of incoherence; but this is not a true incoherence, such as is heard when the patient is hallucinatory; and the delusions are based upon the delusions or illusions present at the time of onset of the illness. In mania proper, there are no hallucinations, or very few, nor is this seen in hypermania, except in conditions that suggest fever. (Fever was present for a long time in this case.) This should be carefully separated from the manias of the maniac-depressive group. Dr. Riesman's case belongs to the infectious group, to which mania does not belong. Mania is not associated with infection, as this is ordinarily understood; though it may be with toxemia or with poisoning from gout. In Dr. Riesman's case excitement came on rapidly, and soon reached a certain level; and that level was

maintained fairly evenly for many months. The course was not like that of the excitement of a mania, which often covers a single sweeping curve or a series of more or less regular fluctuations. When subsidence occurred in this case, it did so with rather great rapidity.

In speaking of the classification of such cases, Dr. Dercum discussed the question whether they belong to the manias, as this term is ordinarily understood. He said that they contain all the features of delirium—the hallucinations, and the fugitive and fleeting delusions, seen in delirium and confusion. They are cases of delirium long maintained; or of long-maintained, active confusion, with great excitement. He thought that our literature requires revision in this respect.

Dr. Alfred Gordon did not recall whether Dr. Riesman had said anything about heredity in this case. He considered this of importance, and suggested that it would be well to look into the woman's heredity, in order to make the study of the case complete. Of course, he said, toxemia would suggest itself to anyone's mind. In these puerperal cases, a careful examination should be made of the pelvic contents; as there might be a small focus of sepsis somewhere in the uterus or in the ovaries or Fallopian tubes. Some things about the case looked to him like grave hysteria, some manifestations being hysteroidal in character.

He asked whether the patient had been treated at home, and said that he had an idea that patients treated at home usually received larger quantities of hypnotic drugs than they ought to have. When treated away from home, and directly under the physician's control, this can be prevented. After dosage with hypnotics is once started, it is usually kept up. He had a patient who had been under his care for weeks. At first, she was having very bad nights; but she is now taking no medicine at night, and is sleeping well. This has been accomplished by keeping her out of doors a great deal and making the hygienic conditions as good as possible. Dr. Gordon thought that in such cases one should resort to hydrotherapeutics and avoid hypnotics. The fact that the cause cannot be found does not prove that there is no toxemia.

Dr. Richardson agreed with Dr. Dercum that these cases belong to the class of infection or post-infection deliria. He had seen a number of them and they all differed from maniac-depressive insanity especially in the strong hallucinatory element present in the infection cases. He recalled the case of one woman in which the duration was fully that of Dr. Riesman's case. He mentioned a recent postinfection case in a man, following pneumonia, in which the leucocyte count, on admission, was only 2,000.

Dr. Lloyd agreed with Dr. Gordon that in the home it is usually necessary to use more hypnotics than in the hospital. In the latter, they may be dispensed with to a considerable degree; because all necessary hydrotherapeutic appliances are at hand. In the home, however, he did not see that anything could be done except to use enough hypnotics to maintain a quieting effect. His experience was that cold packs and wet packs can often be substituted for a considerable amount of hypnotics; though this, of course, depends upon the nature of the case.

Dr. Dercum believed that in hospitals drugs are sometimes used with insufficient frequency, physicians being absurdly afraid of them. He said that very little harm can be traced to the use of drugs in widely excited cases, though it is the fashion to avoid their use or even make a show of their excessive avoidance. In some of the German clinics the patient receives a hypodermic injection before he is put into the bath, so

that he can be properly handled. Dr. Dercum thought that if the morphine thus given quieted the patient, the bath was unnecessary. The giving of baths to such patients presents some difficulties, and they are not used quite so much abroad at present as formerly.

Regarding the use of baths in the home, Dr. Dercum said that it is true that they are very difficult to give there. Bathing in bed, between blankets, tends to quiet the patients. Warm baths and packs chill them less. The patient is kept warm with sweating. If, however, the patient is sweating excessively, and the amount of sweating is increased, one may thus increase the exhaustion. He had seen hospital cases in which he felt confident the patient had yelled and struggled to death. Exhaustion was favored by the fact that quieting drugs were not used in sufficient amounts. Trional and sulfonal he considered most valuable. It is, he said, rare to see hematorporphyrinuria, which occurs only when the drug is used recklessly. After the drugging has been used, the physician can work with greater ease. Drugs that do not depress the circulation and the heart action, such as trional and scopolamin, can be employed.

In regard to treatment inside and outside hospitals, Dr. Dercum said that the question has two sides to it. At home, one can secure more skilled nurses than in the hospital, as most institutions will not allow the physician to bring in skilled attendants from the outside. He doubted whether in cases of typhoid fever the patients' chances would not be better at home than in an institution.

Drugs are sometimes used with insufficient frequency in hospitals, and are sometimes employed excessively outside. Most physicians are content if the patient gets four hours of sleep in the twenty-four. While it is not necessary to have eight hours, and four are sufficient for a time, continuous insomnia is very dangerous; and cases are sometimes lost in hospitals from exhaustion following continued insomnia. Ether is used for surgical proceedings; and chloroform, if necessary. Dr. Dercum did not, therefore, see why the physician should hesitate to use sedatives properly. They should be given in amounts sufficient to produce sleep. The same drug should not be used every time, but the physician should change from one to another. In this way, no marked changes in the blood are produced. When used properly and skilfully, as they should be used, no harm will be done. Dr. Dercum thought that the profession is in the habit of decrying the use of drugs too much, and said that the physician will know when to withdraw them.

Dr. William H. Wells said that he had attended the patient in two confinements. The first labor was terminated by a low forceps delivery and was followed by a perfectly normal puerperium. The second was perfectly natural; and on the seventeenth day after delivery, the puerperium having run a perfectly normal course, the patient developed this apparent toxemia, which, two weeks later, developed into mania.

Dr. Riesman, in closing, said there was no hereditary factor in the case. He had known and attended the parents and was acquainted with the brothers and sisters and all were normal persons. Uterine examinations for the purpose of disclosing the existence of pelvic disease had been repeatedly made but with negative results. The temperature, as the chart showed, was not one of sepsis, and there had been no leukocytosis. No local focus could be discovered anywhere in the body.

The patient was treated at home, because that was thought to be the best course. Conditions were such that for all practical purposes she had

the seclusion and quiet of an institution, plus the watchful care of nurses constantly under the eyes of the physician and the family.

Hydrotherapy had been tried in the form of wet packs, but they had had a bad effect, putting the patient into collapse on every trial.

Dr. Riesman thought that physicians should not be bound too much by names. The case, in his opinion, was one of mania but not of the depressive type of psychiatrists. It was an infectious mania as no one who saw the temperature chart could question, and hence the title given to the paper of febrile mania of long duration. In looking through textbooks on psychiatry he had not been able to find a parallel case. He did not think that the mental condition should be called delirium. If one did not see the graphic record and only heard the recital of the patient's psychic state, one could not help classifying the latter as one of mania. It was necessary, he thought, to distinguish between degenerative mania, the maniac-depressive insanity, and infectious mania. The mental phenomena of the latter differed somewhat from those of the former, but perhaps no more than insanities of the same class often differed among themselves.

Though it might appear that drugs had been given in extraordinary quantities, those quantities had really been the lowest that could have been employed. If he had to treat the case over again he would give even more, for whenever sleep was produced by the drugs the patient's condition was better. He fully agreed with Dr. Dercum in believing it wise to induce sleep artificially if the sleep proved beneficial. He had not seen hematuria produced by the remedies used.

Dr. Dercum remarked that he had not meant to criticise Dr. Riesman's use of the term hypermania. He had himself used it; but he wished, from the purely psychic standpoint, that there were a better term, because it covers cases that are not such as the term mania should be limited to.

A CASE OF SYRINGOMYELIA WITH INVOLVEMENT OF FACE, SCALP AND LARYNX

By Alfred Gordon, M.D.

Mrs. M. McF., aged 45, noticed about five years ago loss of pain and temperature senses in both hands and left arm. Burns or contact with hot or cold objects were not perceived by her. On a number of occasions she discovered burns, ulcerations, erosions on the skin without suffering pain. The healing of these ulcerations would be a long procedure. Gradually the condition extended and paresthesias developed.

At present she complains of a numbness and tingling in her thorax from the waist up to the face, left arm and right hand. She frequently gets headache in the left side of the head. She perspires very little even in the hottest days of summer, but only on the left side of the body. Her arms and hands feel exhausted upon the least exertion. Objectively she presents a distinct syringomyelic dissociation affecting on the left side: hand, arm, thorax (except breast), upper part of abdomen, face along the lower jaw, neck, back as low as the lower angle of scapula, left temporal region, vertex and occiput. On the right side: arm (except deltoid region), hand; on the neck there is only a diminution of sensory disturbances for pain and temperature. Touch is preserved everywhere. Tongue, pharynx and larynx are also anesthetic on the left side. The

left vocal cord is decidedly anesthetic. Within the last two to three years a hoarseness developed which at times becomes very marked. The hands show slight wasting, the grip of both hands is poor. The lower extremities are not involved except that the knee-jerks are increased. The eyes show a somewhat sluggish pupil on the left and a certain degree of neuro-retinitis with choroiditis. The chief interest of the case lies in the involvement of the face, scalp, larynx and pharynx. There are in the literature only 27 cases according to the statistics of Egmont-Baumgarten (*Berliner klin. Woch.*, 1909, No. 34) with involvement of the larynx and with hoarseness as a symptom. The case is therefore one of syringomyelia and syringobulbia.

A CASE OF PSEUDOHYPERTROPHY AFFECTING THE LOWER AS WELL AS THE UPPER EXTREMITIES

By Alfred Gordon, M.D.

A colored boy twelve years of age presented from early childhood some weakness in the lower extremities. At present he shows very much enlarged calf muscles which contrast strikingly with the rest of the limbs. He presents also the typical difficulty of sitting down or getting up, climbing on his four limbs, marked lordosis of the spine, protrusion of the abdomen, recession of the scapulæ—all characteristic of the pseudo-hypertrophic form of myopathy. The biceps muscles of the arms when the latter are not flexed present an unusual hardness, and when an attempt is made by the patient to flex his arm, viz., to contract the biceps, the latter becomes unusually soft. Evidently the dystrophy or rather pseudo-hypertrophy affected also the biceps muscles. The latter observation is rarely observed.

A CASE OF PERIODIC PARALYSIS

By Charles S. Potts, M.D.

F. E. aged 17 years, single, stenographer by occupation. Family history negative. Until eighteen months previous to July, 1909, the patient has always been a healthy active boy. At that time about once weekly he began to have spells in which the legs would become weak, so that while he could stand and walk with difficulty, he could not raise the leg sufficiently to go up steps or over a curb. These spells seemed to come on after unusual exertion and lasted about a day. For some hours before the spell would appear he would feel tired. He was first seen by Dr. Potts on July 9, 1909, previous to which date the patient had not had a spell for six weeks. This attack began the previous day and when examined he could neither stand nor walk, although all movements of the legs and feet could be made slightly. Dorsal flexion of the foot was most impaired. All movements of the arms and hands were present but impaired, but not to the same extent as those of the legs. Cranial nerves were not involved. The action of the sphincter was normal. Tendon jerks were all lost and when the soles of the feet were irritated the toes moved in neither direction. (Other skin reflexes were not tested.) Faradic contractility was absent and there was no pain or tenderness. Tactile and pain senses were normal. The next day he went to his business, feeling perfectly well, except as he described it "a little stiff." Re-

flexes were all present and the muscles responded to the faradic current. On August 8, 1909, after playing tennis he had another attack but not so severe as the one above described. On the evening of August 9, Dr. Potts saw him, but the only symptom then present was an increased excitability of all the leg muscles to the faradic current. Until November 20 there was no attack, when after walking about two miles, he was unable to stand on his toes for about two days. On November 14 Dr. Potts again saw him, weakness having appeared the previous day after sitting in the theater. When examined he was unable to raise himself upon his toes and all other movements of the legs and arms were impaired, but the left leg was much the worst. Reflexes (tendon) were all present, but diminished. Faradic excitability was also present but much diminished, especially in the calf muscles of the left side. The patient has a tendency to constipation which he thinks when present has some relationship to the occurrence of attacks. Treatment has been citrate of potassium and laxatives.

Dr. Gordon, in opening the discussion, said that he had seen a peculiar case of periodic paralysis in 1908. The course was different from that in Dr. Potts's case, in which there was no pain. Dr. Gordon's patient, a colored boy of nineteen years, had a sudden weakness of the lower limbs, with marked diminution of the knee-jerks, and distinct pain on pressure. The condition suggested polyneuritis or poliomyelitis, but he was not, at that time, able to decide as to the diagnosis. On the third day the knee-jerks could not be elicited. On the fourth day all the symptoms disappeared. The patient soon had another attack which ran an identical course. Dr. Gordon said that although in Westphal's original description of the condition pain is not mentioned, there are cases with pain; and one may make a false diagnosis of polyneuritis.

Dr. Allen had seen, two or three years previously, a case in a physician, where pressure was not a factor, with rapidly oncoming foot-drop on both sides, lasting eight to ten hours, accompanied with no pain, but followed by great tenderness on the anterior aspect of the legs. Dr. Allen had no way of testing the faradic contractility in this case. Pain was present for about a week following the rather rapid disappearance of the paralysis. A year or a year and a half, possibly two years, after this, there was again an attack of foot-drop, not so complete as the first, also with the dull pain on the anterior aspect of the legs.

The feature in Dr. Potts's case that had especially interested Dr. Allen was the sudden loss of faradic contractility, which is supposed to be due to the fact that the motor nerve is no longer a conducting medium.

Dr. Gordon said that he had examined three cases in which there was loss of both faradic and galvanic contractility, which was regained in all three cases.

Dr. Weisenburg reminded Dr. Potts of a case of his in which during life there was paralysis of one leg, with pain due to a tumor pressing on the spinal cord.

Dr. Potts replied that he had not made the diagnosis of periodic paralysis in the case referred to by Dr. Weisenburg. The patient had paralysis in one leg, with pain; and most of the time she was stupid from the effects of her uremic condition. He had suggested that the condition appeared something like a tumor, but had not pretended to make a positive diagnosis. There was however a distinct variation in her symptoms from day to day, that is the paralysis was more marked some days than others,

and on some examinations, the Babinski phenomenon was present while at others it was not.

Regarding the electric phenomena, Dr. Potts said that he had never before seen a case of periodic paralysis. The text-books state that in this disease there usually is loss of both galvanic and faradic contractility, which comes on comparatively suddenly, and disappears equally so. In mild attacks the reactions may be only diminished. The character of the electrical reactions has been referred to by one author as evidence that the condition is a disorder of the muscular fibers due to some metabolic change.

Dr. S. D. Ingham reported a case of probable syphilitic multiple neuritis.

Dr. Mills said that it had struck him at first that the case might be one of a double epiconal lesion, though this would, of course, be a very rare condition. Yet the parts paralyzed, in the absence of any very definite statement about sensation and in the absence of typical symptoms of multiple neuritis, made him think the epiconal diagnosis worth considering. Some neuritis occasionally goes with such intraspinal lesions. The pains were of a shooting character unlike the usual pains of multiple neuritis.

Dr. Eugene Lindauer reported a case of *tabes dorsalis* showing a Charcot joint of the hip.

Dr. T. H. Weisenburg made remarks on the occasional difficulty in diagnosis between brain tumor and general paresis.

Periscope

Allgemeine Zeitschrift für Psychiatrie

(LXVI, 1909. Hft. 3-4)

1. Treatment of Youthful and Adult Insane, Epileptics and Idiots in Same Institution. KONRAD ALT.
2. Causes of Death and Other Pathological Findings in the Insane. RUDOLF GANTER.
3. Plasma Cell in General Paresis. II. BEHR.
4. Insanity in Brothers and Sisters. H. O. SCHLUB.
5. Dementia Præcox in Childhood. H. VOGT.
6. Fear of Water and of Military Service. R. GERLACH.
7. Degenerative Psychoses. J. LOEWENSTEIN.

1. *Treatment of Youthful and Adult in Same Institution.*—In the general increase of the insane, epileptics and idiots in Prussia, that of the youthful patients has been most marked. Considering the arrangements for their care and treatment the author draws the following conclusions: (1) The prevailing opinion, in certain quarters, that the youthful epileptics and idiots under the law entitled to enter institutions have less need of psychiatric care and treatment than adults is unjustified. It is especially young patients of the classes mentioned who need careful psychiatric examination and treatment. (2) A separation of the youthful insane epileptics and idiots according to curability or incurability, or according to their form of disease and their internment in different institutions, is inappropriate and impracticable. (3) The addition of a suitably arranged department for young patients to an existing curative and custodial asylum for adults, that is the treatment of youthful and adult insane epileptics and idiots in the same institution, is preferable to the establishment of special institutions for young patients of this kind. (4) For many of the youthful insane, epileptics, and especially for idiots, is the addition to the institution of a department for psychiatrically organized family care of especial benefit.

2. *Causes of Death in Insane. Hematoma Auris.*—A statistical study based upon the findings reported in 1,017 autopsies made at the Saarge-mund District Asylum from 1880 to 1904. As to clinical diagnosis, the author divides the cases as follows: General paresis, 299 cases; dementia præcox, 233 cases; presenile mental disturbances, 77 cases; senile dementia, 204 cases; imbecility, 50 cases; epilepsy, 87 cases; periodic insanity, 20 cases; traumatic insanity, 15 cases; alcoholic insanity, 11 cases; puerperal insanity, 12 cases; tumor, febrile delirium, etc., 9 cases. The author does not state just how he was able to arrive at an exact clinical classification of his cases, a large portion of which must come from a period antedating the recognition, at least of the dementia præcox group. Of all these patients 19.8 per cent. died of tuberculosis, which figure represents a middle position among the percentages of death from this cause reported from different institutions. His investigations led to the conclusion that about half of these patients were infected prior to admission, the other half developed the disease in the institution. The highest death rate however was from diseases of the lungs other than tuberculosis, chiefly

pneumonia, the percentage of deaths from this cause being 24.4. To diseases of the circulatory organs 7.7 per cent. of the deaths were attributed, among these valvular disease and arteriosclerosis playing the chief part. To diseases of the abdominal organs 3.6 per cent. of the deaths were assigned. Among these the highest figure is furnished by peritonitis with 11 deaths, next comes strangulated hernia with 7 deaths. Diseases of the urinary organs are also included here, and give the moderate figure of 7 deaths. Diseases of the brain are made responsible for 16.4 per cent. of the deaths. Among these the author includes deaths in epileptic and parietic seizures, which furnish respectively 26 and 87 cases. Sixteen deaths were due to epilepsy, while 24 are attributed to hematoma of the dura. The cause of death is ascribed to a malignant tumor in 35 cases, or 3.4 per cent. Among these, carcinoma was the variety of tumor in 30 cases. Under general diseases causing death the author includes marasmus, held responsible for 40 deaths, and in connection with decubitus for 27 deaths more, a total of 67 deaths, mainly among the senile and parietic demented; exhaustion, decubitus alone, diabetes mellitus, osteomalacia, pernicious anemia and gangrene of a foot. To infectious diseases 128 cases, or 12.5 per cent. of the deaths are attributed. Under these are included septico-pyemia with 49 deaths, dysentery with 68 deaths, typhoid fever with 5 deaths, erysipelas with 4 deaths, diphtheria with one death and parotitis with 11 deaths. Accidents furnished 1.5 per cent. of the deaths, most of them due to asphyxia, while suicide terminated the scene in 1 per cent. of the cases. The author has arranged his results in tabular form and enters into many particulars with regard to the ages of the patients, the percentages of the different causes of death among the different clinical groups of patients, and also gives some account of the lesions found, etc., all of which space does not permit entering upon here. Among the 1,017 cases examined, hematoma auris was found in 45 cases, or 4.4 per cent. Among these it is noteworthy that the lesion was found on the left side alone in 20 cases, while in 6 it was confined to the right side, and in 19 cases it was bilateral. This is rather in keeping with the view which attributes the majority of these cases to boxes upon the ear administered by attendants, but the author has been able to observe some cases in which he thinks this etiological factor could be positively excluded, and is of the opinion that at least a certain per cent. of these cases occur independent of trauma.

3. *Plasma Cell and General Paresis.*—H. Behr examined the nervous system especially with regard to the presence of Marschalko's plasma cells, in a material from 115 autopsies made at the Lunenburg Asylum. In 59 of these cases the clinical diagnosis of general paresis had been made and in 55 of them this was confirmed by the autopsy findings. In the four unconfirmed cases there were degenerations of the ganglion cells, and diffuse changes with increase of neuroglia, but nowhere perivascular round cell infiltration, and no plasma, or "Stäbchen" cells. Among the 56 remaining cases a few plasma cells were found in 2 cases of arteriosclerotic dementia, in 2 cases of secondary dementia, in 1 case of idiocy, in 1 case of cerebral syphilis, in 1 case of multiple sclerosis, and in 1 case of sarcoma of the posterior cerebral fossa of the skull, in a patient not insane. The author concludes that the presence of plasma cells in the infiltrate into the sheaths of the cerebral vessels is of very great significance for the diagnosis of general paresis. However, the occurrence of a few plasma cells in no way justifies the conclusion that the case is one of general paresis. They are found singly and in localized areas as a

part of an inflammatory process running an acute course in the vessel walls, in other diseases of the central nervous system. Only their diffuse occurrence throughout the whole central nervous system, which like a wide-spread and diffuse inflammatory process of the vessel walls has heretofore only been found in general paresis, can be considered as characteristic of this disease.

4. *Insanity in Brothers and Sisters*.—The author has collected from different sources the histories of 65 families, containing 76 insane brothers and sisters. In 55 of these groups the mental affection was similar in the two or more cases, in 21 groups dissimilar. In the groups presenting dissimilar forms of disease the most frequent combination was manic depressive insanity with dementia præcox. The fact that three-quarters of the insane groups present like psychoses seems independent of whether the parents are insane or not, but this relation alters with the sex of the group members. The groups composed of brothers alone present similar psychoses in 90 per cent. of the instances; in those of sisters alone the percentage is 70, while in the case of the brother and sister groups in only 63 per cent. do the members present similar psychoses. These figures are independent of whether there is insane heredity or not. In the case of twins the form of disease is the same in both members in all cases recorded. The presence of paranoia in the parents does not exclude the affective psychoses in the children, though there is greater tendency to develop the same form of psychosis.

5. *Dementia Præcox in Childhood*.—After reviewing the opinions expressed by a number of authors as to the existence of an early form of dementia præcox, even in children of tender age, and analyzing some of the cases reported, Heinrich Vogt gives accounts of three cases; one of katatonic type in a girl of 5 years of age, one of hebephrenic character in a girl of 9 years, and one suggesting the paranoid form of dementia in a boy of 14 years, who had previously been considered as an imbecile of rather high grade, which have come under his personal observation. He sums up his conclusions as follows: (1) Even before puberty there may occur morbid conditions which from their symptoms, course and general character impress themselves as early forms of dementia præcox. (2) In many cases the symptoms of an abnormally early puberty can readily be recognized, in other cases this is probable. The onset of the profound changes which the organism undergoes at puberty, at an abnormally early period, paves the way for an affection of the brain functions. (3) These early forms of dementia præcox may present themselves under the hebephrenic, the katatonic or the paranoid type. The katatonic is far the most common, the paranoid the rarest of these types. The frequency of the katatonic phenomena is explainable by the fact that the psychomotor conditions existing in childhood lend themselves readily to the production of symptoms of this character. The rest of the symptom-picture shows plainly the characteristic form of dementia with certain peculiarities determined by the character of the juvenile mind. (4) Many cases develop upon an already existing weakmindedness. In others certain peculiarities and mannerisms may have been present for a greater or less period of time. Cases of the latter character are not infrequently misunderstood, and frequently punished in school. Many cases, however, develop in children previously normal. Recoveries occur, but whether these cases relapse later cannot be stated positively. Remissions are frequent. Many cases show relative recovery but with a defect, others dement. (5) For differential diagnosis, besides hysteria, the increase of

muscular tonus in some diseases of the digestive tract, organic diseases and some other affections, and especially cases of idiocy with katatonic symptoms (such as have been described by Weygandt) must be considered. The latter class of cases is not uncommon. On the other hand, cases of dementia præcox which have undergone recovery with defect are quite similar in appearance to such cases. When the diagnosis cannot be made upon the character of the dementia, the course and the accompanying symptoms must be taken into consideration. It may have to remain in doubt in some cases. The cases of dementia infantilis belong in general to the early forms of dementia præcox, but on the other hand they present another and formerly unknown variety of disease.

6. *Fear of Water and Military Service.*—An account of the case of a man of 22 years of age, a soldier in an infantry regiment, who had come into conflict with the authorities on account of his persistent refusal to enter the water with his comrades for bathing and swimming exercises, when commanded. As his refusal was accompanied by all the symptoms of anxiety and fear, he was eventually sent to the Hildesheim Asylum for an opinion as to his sanity. A study of the case there brought out the facts of an injury to the head when about 4 years old, and that since then he had always been dull, could make no progress at school and was considered by his associates as peculiar, if not insane. Examination disclosed the presence of a number of stigmata of degeneration and of such defects in the mental functions as stamped the case as one of imbecility of more than moderate grade. The patient had been able to work and earn a living but always in subordinate positions in which little or no exercise of judgment was necessary. He had even served one year as a soldier without previous conflict with the regulations. His fear of water seems to have originated in being pushed overboard by some of his schoolmates in early life, and acting upon the weak organization this fear seems to have grown into a sort of obsession. The author emphasizes the dangers of the military service for weak organizations and urges the importance of the psychiatric examination of recruits.

7. *Degeneration Psychoses.*—Description of the case of a man of 34 years of age, of good heredity and of normal mental make up, except for a somewhat melancholy disposition, who after some business troubles developed a state of depression with hypochondriacal ideas with periods of agitation and several, apparently not seriously intended, attempts at suicide. Brought into an institution his unrest became so great that he had to be placed in the department for disturbed patients, given sedatives (scopolamin) and at times restrained. He then developed a delusional condition with ideas of persecution upon the part of the physicians, and that his wife had brought him to the institution to have him put out of the way. He no longer showed anxiety and evinced no desire to commit suicide, his whole condition suggesting the development of a paranoia and leading to an unfavorable view of the prognosis. Although his condition had not changed much, he was eventually sent home on trial where he at once quieted down, expressed no longer either hypochondriacal, depressive, or persecutory ideas, took up his work again and except for some neurasthenic troubles remained well. The author thinks that this case can be most readily classed with the delusional psychoses arising upon a degenerative basis, which have been described by Bonhoeffer. He finds characteristic the intense reaction to external influences, on the one hand depression following business troubles, supplanted on the other by a paranoid condition after the necessary restraining and controlling in-

fluences of the institution, which the patient interpreted as persecutions, and resented as assaults upon his life and liberty.

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Revue de Psychiatrie et de Psychologie Expérimentale

(July, 1909)

1. Alcoholism—Symptom of the Constitutional Psychoneuroses. SORK-HANOFF.

2. The Delirium of Interpretation of Sérieux and Capgras. MIGUARD.

1. *Alcoholism in Psychoneuroses*.—The psychasthenic at first does not care to drink, in fact liquor may be disgusting to him. He drinks at first only in a spirit of bravado, or by imitation under the influence of his entourage and only arrives at drinking habits after a preliminary period of effort. He recurs to drink, for he feels that it causes to disappear disagreeable emotional states, it is calming, and acts as a stimulant on his psychasthenic state which is subjectively expressed by a lowering of psychological tonus. It gives, for a time, a little will power, which he lacks, and exercises a dynamogenic influence on the manifestations of psychic energy. As soon as the psychasthenic realizes this kind of relief he resorts more and more frequently to drink until there gradually appear the symptoms of chronic alcoholism. The tendency now comes to have oscillations, it comes and goes. The psychasthenic begins by occasional drinking, arrives at the phase of chronic alcoholism, and finally passes into the stage of *dipsomania*. This regular progression shows the insufficiency of the groupings of alcoholics. Such is broadly the symptomatology of alcoholism allied to a neurosis or more properly a psychoneurosis, based psychologically upon a scrupulous-uncertain character which in its developed form gives the polymorphous tableau of obsessing psychic states.

Another type of congenital organization is found in the *pathological reasoners*. These people love to talk, to pronounce judgments, which later often have the marks of superficiality. They have a high opinion of themselves, are easily offended, have much amour propre. They are not scrupulous and uncertain like the psychasthenic but sure of themselves, decided in their acts. They have a tendency to be egocentric and even to have paranoid manifestations. One is often struck by a sort of eclat to the outward manifestations of their mentality which often marks an absence of profundity. There is a feebleness of the moral feelings infinitely varied in the different cases. Where a delirium develops on this background it is of the form of *folie raisonnante*—psychopathic—inventors, erotomaniacs, querulants, persecuted-persecutors. If the moral sphere is more tainted than the intellectual we have *insanitas moralis*. Ordinarily alcohol affects agreeably from the first this class. So they seek in it not a stimulus but pleasure. They quickly become addicted because of the lack of the inhibitions of a well-developed moral sense. Epileptics often exhibit a strong inclination for alcohol which not infrequently has much to do with their impulsive states and states of mental obscurity. Hystericals do not seem to care much for alcohol. They prefer alcoholic drinks, when they do take them, that taste good. They seem to get little pleasure from alcohol and take, more frequently, to other narcotics. It is important in the understanding and treatment of alcoholism to no longer rest in the insufficient classification into occasional and chronic drinkers, and dipsomaniacs but to uncover the true psychological state.

2. *Delirium of Interpretation*.—The new work of Sérieux and Capgras (*Les Folies Raisonantes*) the author thinks marks a veritable event in the history of french psychiatry.

The systematized deliria and the paranoias are the psychopathic states already described in which one ought to find the delirium of interpretation.¹ The type that the authors try to disengage is a chronic psychosis based on interpretation delirium. The interpretation delirium is a false reasoning, having for its point of departure a real sensation, an exact fact, which because of idea associations related to tendencies, to emotions, assumes, with the aid of erroneous inductions or deductions a personal significance for the patient invincibly impelled in all that relates to him. The clinical picture presents multiple and organized forms, hallucinations are rare and contingent, the lucidity and psychic activity are persistent, the evolution is by progressive extension. It is incurable and terminates without dementia. The old type of persecuted-persecutors contained, among other things, certain interpreters with numerous revindicators. It is necessary to exclude these from the cases considered as delirium of interpretation. The onset of the malady is not often seen by the physician and is not infrequently impossible to locate because of retrospective falsifications. If there be some dementia toward the end it is explained by senility and arteriosclerosis. These cases do not dement. The word dementia has been too loosely used. All these cases show is a lack of critique which is found normally under the influence of emotions. Sérieux and Capgras believe it to be ideo-affective in origin. The article closes by a brief reference to the case of Rousseau, who the author believes well illustrates the delirium of interpretation.

(August, 1909)

1. The Attenuated Form of Delirium of Interpretation. HALBERTSTADT.
2. Communicated Insanity. FILLASSIER.

1. *Attenuated Form of Delirium of Interpretation*.—The delirium of interpretation is a systematized chronic psychosis characterized by: (1) The multiplicity and organization of delirious ideas, (2) the absence or scarcity of hallucinations and their contingency, (3) the persistence of lucidity and psychic activity, (4) the evolution by progressive extension of the ideas, (5) the incurability without terminal dementia. The attenuated forms occur mostly in women having as foundation a slight mental debility. The beginning is insidious and evolves for some time without producing pathological reactions. The delirium is poor, grouped about one central idea, nearly always persecutory or of prejudice. The author does not think the condition wholly curable. The delirium develops from a controlling idea, extends very little, contrary to what is observed in the classical forms. It ceases to evolve at a given moment and often even the patient forgets it in some sort, becomes resigned, accepts the situation, forms no longer new interpretations from reality but never abandons belief in the reality of his old delirium. The attenuated form of the delirium of interpretation differs from the attenuated and abortive deliria proper to superior degenerates and should also be distinguished from the delirium of the revindicators. This is the term used by Sérieux and Capgras to denominate persecuted-persecutors, litigants and querulants, in

¹ See abstract of "Diagnosis of the Delirium of Interpretation," by Sérieux and Capgras in *Journal* for March, 1909, p. 181.

whom they consider that the mental trouble is different from that presented by the interpreters. The psychoses of these subjects are susceptible of arrest, and of attenuation if not of complete cure. But even then there is a marked difference from the delirium of interpretation; the two symptoms given by Sérieux and Capgras serve equally to make the diagnosis: (a) The delirious idea among these cases is a veritable obsessing idea; (b) there is generally a maniacal exaltation which is not found in the interpreters; these are only subject to passing states of excitement, as is often found among the *débiles*. This psychosis is nosographically clearly defined. This is not so concerning its genesis and its causes. The mental debility of the subjects serves to explain the poverty of their delirious conceptions.

2. *Communicated Insanity*.—A report of several cases.

WHITE.

Review of Neurology and Psychiatry

(Vol. VII, No. 2. February, 1909)

1. Gonococcal Meningitis. GEORGE HENDERSON and W. T. RITCHIE.

2. On the Origin of the Facial Nerve. N. BISHOP HARMAN.

1. *Gonococcal Meningitis*.—This is one of the rarest forms of cerebro-spinal meningitis. The chief interest of the case lies in the diagnosis, the points of which the author summarizes as follows:

1. A man, aged twenty-three, developed acute cerebro-spinal meningitis—and subsequently a polyarthritis—eight days after acquiring a gonorrhea. He made a complete recovery without any specific anti-meningococcal treatment being employed.

2. Gonococci, but no meningococci, were obtained from the urethral discharge.

3. The only microorganisms detected in the cerebrospinal fluid were scanty intracellular Gram-negative diplococci, with their apposed surfaces flattened.

4. All efforts to obtain cultures from the cerebrospinal fluid and from the blood were unsuccessful.

5. A young guinea-pig and three mice remained well after having been inoculated intraperitoneally with the cerebrospinal fluid.

6. The patient's blood serum agglutinated gonococci readily, but it had only a slight agglutinative action upon meningococci.

7. The patient's blood serum contained a thermostable gonococcal immune body, but not a meningococcal one.

(Vol. VII, No. 3. March, 1909)

1. A Review of the Question of Aphasia. S. A. K. WILSON.

2. "Lachrymal Reflexes: Pressure Sensibility of Head and Neck: and the Squeezed-Tongue Sensation." LEONARD J. KIDD.

2. *Lachrymal Reflexes*. Since 1902, at which time Spiller brought the diagnostic value of the naso-lachrymal and conjunctivo-lachrymal reflex prominently to the notice of clinicians, the author has seen only two cases of hysterical hemianesthesia, limited to the face, on which it could be tried. In both of these cases, a definite lachrymation was obtained by passing a probe into the nostril of the affected side and moving it about for five seconds. In regard to the linguo-lachrymal reflex, obtained by a

powerful squeeze of the tongue, the writer suggests that it be tried in a large number of tabetics of the upper type, and in general paretics, hemilingual spasm, and after gasserianectomy. On the afferent path, or paths, of pressure-sensibility of the head and neck in man the clinical and pathological evidence is conflicting. The afferent seventh nerve probably conveys deep sensibility fibres.

(Vol. VII, No. 6. June, 1909)

1. The Proteid Content of the Cerebro-spinal fluid in General Paralysis. ERNEST JONES.

2. On the Wassermann Reaction, and especially its significance in Relation to General Paralysis. CARL HAMILTON BROWNING and IVY MCKENZIE.

1. *Proteid in Spinal Fluid in Paralysis.*—The kind of proteid that is increased in the cerebrospinal fluid in general paralysis is a matter not only of diagnostic significance but also one of great theoretic interest in relation to the special substances that are provisionally termed the Wassermann anti-bodies. The albumin and globulin proteids are dealt with in the article. The technique in examination is considered. The writer adheres to the view that only the globulin proteid is present in normal fluid. The Wassermann reaction depends on an increase of some special form of euglobulin that is normally present in the serum. An increase in the globulin content of the cerebrospinal fluid almost invariably occurs in general paralysis; the proteid concerned is a euglobulin. A peculiar qualitative change takes place in this euglobulin, and is associated with the formation of the "anti-body," which is the active agent in the Wassermann reaction. It is maintained that the two most accurate tests for this euglobulin are the Noguchi butyric acid test and the ammonium sulphate ring test described. These tests are of the greatest value in distinguishing general paralysis from non-syphilitic affections of the nervous system.

2. *The Wassermann Reaction.*—The author states that the object of his review is to indicate that the independence of syphilitic and parasymphilitic infections has not yet been established, and to suggest that, on the one hand, further search for the contagium vivum of syphilis in the body during the stage of general paralysis is necessary, and that, on the other, a line of treatment might be adopted on the supposition that the disease is the manifestation of an active and progressive process. In consideration of the hopeless character of general paralysis a trial of the Balfour method in sleeping sickness, by intraspinal injection of the patient's own blood serum, might be recommended, on the principle of combined therapy. Among the subjects reviewed in the paper are: The immunity of general paralytics to syphilitic reinfection, the latent period between syphilitic and so-called parasymphilitic disease, the distribution of the lesions in para-symphilitic disease, and the resistance to anti-symphilitic treatment.

C. E. ATWOOD (New York).

Deutsche Zeitschrift f. Nervenheilkunde

(Band 35, Heft 5 and 6)

16. Pathological Anatomy of Gliomatous Syringomyelia. LASAREW.
17. Astasia Abasia. WIMMER.
18. Contributions to the Subject of Microcystic gliomatous Neuro-epithelioma. THIELEN.
19. Paroxysmal Paralysis. BORNSTEIN.
20. Experimental and Chemical Studies upon Cholin, and its Relation to Epilepsy. HANDELSMAN.
21. Pathology of an Early Case of Progressive Muscular Dystrophy. FINKELBURG.
22. Friedreich's Ataxia. FLATAU.
23. Hereditary Nystagmus. MÜLLER.

18. *Microcystic Neuro-epithelioma*.—These cases are rare. The author reports the pathological and clinical findings.

The patient was a female, æt. 51, rather corpulent. Negative family history. For two years complained of pains in the back and left leg. Examination showed edema of both legs, no visceral disturbances. Urine negative. Spinal column showed no external changes. The nervous phenomena consisted in a marked flaccid paralysis of the lower limbs, especially involved were the ileopsoas and quadriceps extensor. The muscles of the trunk and upper extremities showed no disturbance of function. Knee jerks were increased. Plantar reflex and Babinski absent. Sensations for touch slightly diminished, in front from below the umbilicus. Pain sensation reduced, temperature, especially for heat, was lost. Diagnosis: transverse lesion at the level of the eighth thoracic segment. Microscopically the spinal cord showed an intra-medullary glioma throughout its entire length, varying in thickness at the different levels. Following Rosenthal, the writer would call it a neuro-epithelioma gliomatosum microcysticum.

20. *Cholin and Epilepsy*.—The writer sought to prove what factor was played by cholin in the origin of epileptic convulsions. His studies were both experimental and chemical. Dogs and guinea-pigs were injected under the dura and into the cerebrum. The comparison of the chemical with experimental results indicates to the author that cholin plays no role in the origin of epileptic convulsions.

21. *Progressive Muscular Dystrophy*.—Report of a case with necropsy. The onset occurred at eleven months, with wobbling of head, and difficulty in sitting erect. Examination showed pseudo-hypertrophy of the calf and gluteal muscles, while the upper arm and shoulder muscles seemed atrophied. The forearm and hand muscles showed no changes. The child came to necropsy when 21 months old. The brain and spinal cord showed no changes with the Nissl. The gluteal and gastrocnemius muscles consisted almost entirely of fat tissue. Muscle fibers were few in number and were surrounded by thick bands of fibrous tissue. The quadriceps and back muscles showed the typical dystrophy changes, without however marked fat infiltration. The rectus abdominus, tongue and heart muscles showed no special changes. The blood vessels showed no thickening. The writer also compared these findings with those of a normal child of eighteen months and he infers that the process was not secondary but primary in the dystrophy case.

23. *Hereditary Nystagmus*.—Müller differentiates two forms of heredi-

tary nystagmus; the one as part of a clinical syndrome as in Friedreich's ataxia, the other idiopathic without other nervous symptoms occurring as a family symptom through several generations. Like hemophilia it is transmitted by the female, but seen only in the male. The writer had the opportunity of studying an uncle and nephew of this family. The nystagmus was continuous, horizontal and rotary. Besides loss of pigmentation of the choroid coat and myopia there were no other nervous symptoms.

S. LEOPOLD.

Book Reviews

LECTURES ON HYSTERIA AND ALLIED VASO-MOTOR CONDITIONS. Thomas Dixon Savill, M.D., Lond., Physician to the West End Hospital for diseases of the Nervous System, etc. William Wood & Co., New York. \$2.50.

Savill's lectures have the great merit of being readable. One is carried along with ease and profit, and there is much good sense in the mode of presentation, one-sided thought it be. His definition, which is provisional, is that "Hysteria is a complex protean disorder, chiefly affecting the female sex, manifested by an immense variety of nervous, neuromuscular, neurovascular, sensory and other symptoms, which may be referable to almost any organ or part of the body; symptoms which are often determined by emotion, abrupt in their onset, reaching their maximum at once, paroxysmal in their course, and which are apt to terminate suddenly and completely; symptoms which are disabling and distressing while they last, but never fatal; unaccompanied, as a rule, by any very obvious physical signs during life, and unaccompanied, as far as we can discover, by any gross microscopic anatomical changes."

All the symptoms point to an instability of the reflex, and other nervous centers. That the chief defect rests in the sympathetic system, and particularly in the reflex centers of the neurovascular system is the conclusion he has come to as a result of his observation during the past twenty-five years.

These general ideas he expands in eleven lectures, whose chief value is clinical. The author's psychology is that of the Charcot period; Janet's views are well presented, and some idea of Breur's and Freud's work are given; but there is a general lack of knowledge of the many German, French and Italian studies on hysteria. Perhaps they are superfluous in so individual a form of presentation.

The work is well printed, and taken as a whole is a welcome addition to the long list of works on hysteria.

JELLIFFE.

KLINISCHE BEITRÄGE ZUR LEHRE VON DER HYSTERIE. Nach Beobachtungen aus dem Nordwesten Russlands. Von Dr. Georg Voss, Privatdozent für Psychiatrie und Neurologie an der Universität Greifswald; Oberarzt an der Psychiatrischen und Nervenlinik. Gustav Fischer, Jena.

This is a timely monograph, and for several reasons. In the first place it is an excellent and thorough discussion of the symptomatology of hysteria from the general and special standpoint. In eleven chapters, and a bibliography, practically the entire range of the hysterical phenomena is covered; the author limiting himself practically to the modern period of the study of this large and illy defined group.

Secondly, he has given by far the most far-reaching and minute discussion of the recent studies, filling in a gap that no "zusammendes

referat" has up to the present time given us. He has not attempted a philosophical coördination of the modern work, but has been content to sort it, arrange it, and bring it into correlation with his own original part of the monograph.

This third feature, namely the author's own findings in the study of 123 patients in the St. Petersburg Marienhospital for the Poor, is of particular value, since it gives a comprehensive and faithful picture of the disorder as seen in the Russian race—thus filling an ethnological gap and offering extremely interesting grounds for comparative study. This material cannot fail to interest American neurologists, in view of the immense immigration from Russia, even though the St. Petersburg district may have been drawn on but slightly in our Russian immigration.

It cannot be said that Voss has solved the hysteria problem; he has attempted no solution, but he has given us by far the best combination of a thorough-going modern study of his clinical material with a rich critical citation of later day observations bearing on his own findings. The character of the monograph does not lend itself to extensive citation for the purposes of a review, but one is impressed with the author's almost phenomenal grasp of these recent studies, and the painstaking analysis of his own material. It is a contribution of real value to the clinical side of the subject; the best that has appeared in the last five years at least.

JELLIFFE.

UEBER FAMILIENMORD DURCH GEISTESKRANKE. Von Medizinalrat Dr. P. Näcke in Hubertusburg. Carl Marhold, Halle a. S.

At the present time it would seem that murder of the members of a family was getting more and more frequent, and hardly a day goes by without the details of such family catastrophes appearing in the news columns. Either a wife and child, or two or more children, sometimes a whole family are killed.

It is to the mental status of those who commit such homicidal acts that Dr. Näcke has turned his attention in this study. He first gives some examples and then discusses the general ideas regarding such. In a second chapter he takes up the matter statistically, and treats of the motives, and accompanying circumstances. A third chapter deals with the types of mental disorder found. His general figures are of interest, but the original must be read to make them available in argumentation. Thus alcoholic psychoses were responsible for 25 per cent, paranoia for 31 per cent., epilepsy 28 per cent., dementia præcox, particularly the paranoid type, 33 per cent., general paresis 8 per cent., melancholic depressions, 9 per cent., etc. For men chronic alcoholism, paranoia and epilepsy play the most important role, while for women melancholia, paranoia and dementia præcox are noted.

The author further takes up the question of prophylaxis, gives a complete tabulation of the cases on which his statistics are based, and taken all in all has given us a very important study in family homicidal acts, especially in their relation to mental disease. It is a type of work particularly to be recommended to those interested in medico-legal work. Jurists would profit by reading it.

JELLIFFE.

THE MATTER WITH NERVOUSNESS. H. C. Sawyer, M.D., member of the American Medical Association. Cunningham, Curtis & Welch, San Francisco and Los Angeles, 1909.

This is a very entertaining book, divided into 51 chapters, and contains 210 pages. In the introduction we read that "nervousness is no merely functional trouble; it is no mood of the mind; no notion of the nerves. Nervousness, whether it be slight or severe, transient or permanent, is always a surface sign of deep-lying bodily deteriorations that are real as the fracture of a bone." This sentence is the keynote of what follows in the book. The author divides medicine into the medicine of the spirit, the medicine of the mind, and the medicine of the body. Nervousness is a sum in addition: thus, over-sensitiveness + provocation = migraine; over-sensitiveness + intestinal poisoning = depression, etc. It is too bad that the author who makes use of so many nice anecdotes and quotations throughout the whole book fails to give a clear distinction between spirit and mind. He merely states that medicine of the spirit deals with things of the spirit—with that response which every man makes to the gift of life. Perhaps "nervousness," whatever that term means to the author, is not a sum in addition. We cannot quite see why over-sensitiveness + provocation, or over-sensitiveness + intestinal poisoning could not produce appendicitis or anything else. No one has ever proved that depression is due to intestinal poisoning, neither has this author. That nervousness is a structural disease of nerve cells, and that poisons are first of all factors in nervousness still remains to be demonstrated. The author fancifully adheres to the physiological, paying little if any attention to the psychological. He calls the use of association in medicine of the mind "one of the finest games in nerve cure," and puts it in the same category with prayers, charms, amulets, phylacteries and mezuzahs. Without entering into the kabala of phylacteries it would seem that the author either paid no serious attention to the association work done by Wundt, Kraepelin, Jung, Sommer and others, or else he is ignorant of the true nature and function of the mezuzah. The author also objects to "long medical words" like psychic, toxic, insomnia, obsession, etc., which emphasize anything and everything but the main thing—the secret source of all the trouble, "and wants us to speak of nerve-stuff, core-stuff and outer-stuff that lie behind the apparatus involved in any given case." The book abounds in wit, humor and satire, and makes interesting reading, but it contains nothing new of the old ideas, and hardly anything of the new ideas as expounded by Janet, Freud and others.

A. A. BRILL (New York).

ZUR KLINIK DER DEMENTIA PRÆCOX. Von Dr. Wieg-Wickenthal, Chefarzt der Frauenabtheilung Landirrenanstalt Gugging. Carl Marhold, Halle. 3 Marks.

This is one of the *Hoche Sammlung* and gives an excellent short discussion of the present status of the dementia præcox group, chiefly from the clinical standpoint. The author has gathered a number of careful histories and uses them to illustrate the chief features of the Kraepelinian doctrines. There is little that is new in the volume, but the case histories are carefully elaborated and the verbal pictures shown are particularly instructive.

JELLIFFE.

UNSERE SCHLAFMITTEL MIT BESONDERER BERÜCKSICHTIGUNG DER NEUEN.
Bearbeitet von Dr. C. Bachem. Second Edition. Verlag von
August Hirschwald, Berlin, 1909.

In this very handy little volume there is presented a clear and thoroughly scientific discussion of the modern hypnotic drugs. The author proposes the division into anesthetics, anodynes, sedatives and hypnotics, being fully aware of the artificial nature of any boundaries.

It is an excellent small brochure for the pharmacologist and practical worker in neurology and psychiatry.

JELLIFFE.

THE FAITH AND WORKS OF CHRISTIAN SCIENCE. By the writer of
"Confessio Medici." Macmillan Co., N. Y., 1909.

This book is a good exposition of the theories, practices and fallacies of Christian Science. The author carefully considers both the theories and practical claims of this cult. His investigations are mostly confined to Christian Science in England, though he draws much from the United States. He cites 200 testimonies of converts who were cured of "kidney trouble, lung trouble, heart trouble, liver trouble," etc., and then asks, "What is kidney trouble, lung trouble, and spinal trouble?" He justly remarks that these are not testimonies, but testimonials, counterpart of which can be seen in any advertisement for some quack medicine. He also cites the case of Dr. G. W. Barret, of St. Louis, who claimed to have suffered from leprosy and was cured by Christian Science. From his published account of this case Dr. B. was never free from some ailment for 30 years. He was taking medicine continually. "It seemed impossible to get rid of biliousness, which from a moral standpoint I have inherited." He claims to have been a physical wreck, suffering from "enlargement and softening of the liver, indigestion, ulceration of the bowels in the most aggravated form, heart trouble, and that most dreaded of all diseases, leprosy," which he thought he contracted while seeing a patient suffering from that disease. "I can now see that it was my fear that fastened the disease upon me." He paid a visit to a Christian Scientist who laughed at him. In half an hour the pain in his bowels was gone, and the next morning the leprosy spots "nearly vanished." The author diagnoses the doctor as a case of hypochondriasis with imaginary infection, and cites a similar case of phobia—fear of leprosy—which came on after the patient read in the Bible about lepers. The author then cites 68 cases "which give but a faint sense of the ill-working of Christian Science." He also quotes freely from the works of American writers, such as Huber, Purrington, Buckley, Goddard, and Cabot, all of whom showed that "Christian Science accepts all testimonials, even the most fantastical and illiterate. That she embellishes what she publishes. That she evades investigation. That her claim to cure organic diseases breaks down under the most elementary rules of criticism, and that she has never cured, nor ever will, any disease except those which have been cured a hundred times by mental therapeutics."

A. A. BRILL (New York).

JAHRESBERICHT ÜBER DIE LEISTUNGEN UND FORTSCHRITTE AUF DEM GEBIETE
DER NEUROLOGIE UND PSYCHIATRIE. Redigiert von Dr. L. Jacobssohn
in Berlin. XII. Jahrgang. Bericht über das Jahr 1908. S. Karger,
Karlstrasse 15, Berlin. 40 Marks.

This remarkable year book comes to us again, bringing the report

of the year's progress in 1908, in neurology and psychiatry. The same energy and thoroughness displayed by the editors and their collaborators in the former years is displayed in this. We note that each year not only are the special journals more fully cited and abstracted, but the outlying journals, reports of societies, etc., are more widely represented.

We need quote only the section on Aphasia, by Pick, of Prague, to indicate how complete this year's volume is. One hundred and forty-six titles on aphasia are given and the impetus given by Marie's destructive criticism is fully mirrored in Pick's very excellent résumé. His general summary expresses very tersely the general drift away from schemata, which has been apparent for some time in German literature, and he notes also that practically only in America have Marie's teachings had much following.

With the appearance of each new year book their value grows. This last is the largest and fullest that has appeared and the publisher has responded admirably to the desires of the editors. Apparently the neurologists and psychiatrists have done their share in supporting it. We can only re-echo an oft-repeated wish, that they should continue to do so and in further measure. This is one of the indispensable volumes in a library. It is more than a mere reference book, to be consulted only when looking up a subject; it is a *vade mecum* to be looked into often to see what is really going on in the neurological world. All other helps sink into comparative insignificance.

JELIFFE.

DIE WASSERMANNSCHE SERODIAGNOSTIK DER SYPHILIS IN IHRER ANWENDUNG AUF DIE PSYCHIATRIE. Dr. med. Felix Plaut. Gustav Fischer, 1909, Jena.

A co-worker with Wassermann in his original contributions concerning the application of the Bordet-Gengou complement-fixation phenomenon to the diagnosis of general paralysis and syphilis, the author has since been the leading worker in that field and is perhaps, more than anyone else, qualified to write a treatise on the subject. The first chapter is devoted to a discussion of the development and mechanism of the Wassermann reaction. The test of complement fixation was the outgrowth of experiments by Bordet and Gengou to demonstrate the theory then held in France, that there was but one complement, contrary to the German idea of multiplicity of complement. These experiments by Bordet and Gengou brought out two important facts; first, that complement was absorbed only when antigen was brought together with its own specific reaction-product; second, that the same complement would activate both bacteriolytic and hemolytic amboceptor. Thus they found it was possible to prove the existence of antibody to an organism, in the blood serum, by placing that serum with a culture of the organism in question in the presence of complement. That complement was absorbed was shown by the inhibition of hemolysis in an hemolytic system subsequently added. In the application of this test to syphilis the difficulty was encountered that the organism was not obtainable in pure culture. To overcome this difficulty Wassermann devised the method which bears his name. In place of a culture or extract of the spirochete itself he employed a watery extract from the liver and spleen of a syphilitic fetus which were rich in spirochetæ. The test proved practically specific for syphilis and, as found soon after, for general paralysis, being positive in both serum and

spinal fluid of the latter disease. But just as the test was coming into general use, Marie and Levaditi brought proof that the reaction could be obtained with an extract from some normal livers as well as syphilitic organs, and still later it was shown that the substance acting as antigen could be extracted from the organs by alcohol as well as by water. This latter finding showed that the substance was not albuminous, nor a true bacterial product, but of a lipoid nature. Some now began to regard the phenomenon as a chemical interaction between two colloids which destroyed the complement. Others held that it was a precipitation reaction and that complement was carried down mechanically by the precipitate. Weil and Braun declared that lipoids were thrown into the system by the destruction of tissue and that the body generated an antibody to this substance. Wassermann still claims that for a positive proof a watery extract of syphilitic organs is necessary. With other substances the reaction may occur, but much less delicately and specifically. Thus the subject is yet far from clear, but the solution probably lies in one of the following propositions: (1) The Wassermann reaction is a specific antigen-antibody reaction for lues, but the antibody has on the one hand the peculiarity that it will react not only with luetic antigen, but also with normal tissue extracts, and on the other hand it is closely related to the lipoids; in other words, a specific albumin-lipoid combination. (2) The reacting substance in the syphilitic serum is no antibody, but a substance which arises as a result of the syphilitic infection and which possesses an affinity for lipoid (toxine?). (3) Specific and non-specific reactions exist simultaneously in the Wassermann test.

In the second chapter the author discusses the comparative values of the various methods in use of performing the Wassermann reaction. The chief variations that have come into use have been the substitutions of other than syphilitic organ extracts for the original antigen on account of the difficulty in obtaining the latter. Of the five forms of antigen which have thus been employed, namely, alcoholic and watery extracts of luetic livers, alcoholic and watery extracts of normal organs and lipoids, the extracts of luetic organs are much more sensitive and the watery extracts are preferable to the alcoholic. Next to the extract of syphilitic human organs, one obtained from guinea-pigs' hearts seems to be the most reliable, but even this often gives poor results. The use of lecithin and other lipoids gives positive results in many cases, but such large doses are required that the lipoid itself often has an anti-complementary action. The conclusion is that the substitution of more easily obtained antigen for the luetic extract does not give as satisfactory results and the original technique is preferable.

Chapter three deals with technique and is chiefly of interest to those who are personally working with the method. The greatest difficulty is the tendency of the organ-extract to block hemolysis by itself, another is the power of some spinal fluids and sera of intrinsic anti-complementary action. The author details controls for all these exigencies. It is important to obtain a strong extract and to standardize it by known syphilitic sera, for in differences of strength of antigen lie most of the discrepancies of the different authors. Regarding the significance of a negative reaction the author does not consider it to mean so definitely that the disease is not present as the positive does its existence. But as the serum is always positive in general paralysis and nearly always in syphilis a negative reaction can almost certainly be regarded as indicating that syphilis does not exist. A partial blocking of hemolysis had best be read as negative

by persons who have not had a long training with the reaction, but the author has found undoubted cases of syphilis with only partial inhibition and with certain reserves usually reads such a result as positive.

Chapter four deals with the clinical specificity of the Wassermann reaction. The author points out that even the Widal reaction is not without the objection that it occurs in some other conditions. All who have worked with the Wassermann reaction agree that aside from some few exceptions, lues can always be detected in an individual, while, also with a few exceptions, cases without lues react negatively. Wassermann has reported 1,010 cases in which lues could be positively excluded, all of which reacted negatively. The group comprised almost every variety of disease. Those authors who have published numerous cases with positive reaction in the absence of syphilis have worked with normal organ extracts, and their failure should be regarded more as a reflection against the substitution than against the method. It is significant that the reaction has a tendency to occur in other protozoal diseases, as malaria and frambesia. Rabbits have been injected with trypanosomes and their sera have acquired a positive Wassermann reaction, but these experiments are open to some objections and further work with the protozoal disease in human species is much to be desired. Much and Eichelberg found forty-five positive results in scarlet fever, but several other authors, including P., have also examined sera from scarlatina patients with universal negative results. It is probable that Much and Eichelberg employed two large quantities of serum. A table is appended of non-syphilitic control cases examined by the author. One hundred cases of spinal fluid were all negative. One hundred and twenty-six cases of serum examined contained five positive cases. In none of these five cases could lues be positively excluded and one had a lymphocytosis of the spinal fluid. The author expresses himself as convinced of the clinical specificity of the reaction.

J. W. MOORE (Central Islip).

THE PSYCHOLOGY OF DEMENTIA PRÆCOX. By Dr. C. G. Jung, Privat Docent in Psychiatry, University of Zurich. Authorized translation with an introduction by Frederick Peterson, M.D., and A. A. Brill, Ph.B., M.D. 153 pp. New York, The Journal of Nervous and Mental Disease Publishing Company. 1909. \$2.00.

This is the third of the monograph series produced by the Journal of Nervous and Mental Disease. Its translators, Frederick Peterson, M.D., and A. A. Brill, M.D., while giving in their preface credit to Kraepelin for having introduced new life into psychiatry, insist that he only offered a general and superficial view of the subject and that he did not enter at all into psychiatry. The present work is the result of three years' experimental labor and clinical observation and is along the same lines as Freud's well-known work on hysteria. In fact, the author admits that his attention was drawn to the subject by the stimulation received from Freud's work. The subject matter is divided into five chapters and a conclusion. In the latter the author frankly admits that this work is simply a beginning and is only an exposition of his own method of diagnostic association study in mental disease and especially in dementia præcox.

The last chapter is of special value in as much as the author gives in detail his method of examining a case and the deductions at which he arrives. The work is well done and should be read by everyone interested in mental diseases.

T. H. WEISENBURG

MIND AND ITS DISORDERS. A Text-book for Students and Practitioners. By W. H. B. Stoddart, M.D., F. R. C. P., Assistant Physician to Bethlehem Royal Hospital. P. Blakiston's Son & Co., Philadelphia. \$4.00.

Dr. Stoddart has given a short manual of psychiatry of about 500 pages. It is divided into three sections. In the first there is a section on normal psychology, the psychology of the insane is treated in a second, while a third takes up the clinical side of the question.

There are about 100 pages in the first section, which is largely drawn from the works of American psychologists, James and Titchener, and calls for no comment, since it is perfectly familiar to our readers. Some fifty pages are taken up with the psychology of the insane. The remainder of the book—with the exception of chapters on staining nervous tissues, the English lunacy laws and cytological examinations of the cerebrospinal fluid—is devoted to clinical psychiatry.

The first section could have been omitted. Although it is very excellent it seems useless to cumber a work on psychiatry with such a comparatively large section on psychology, especially when there is so much to be said on the real subject matter of the book.

The title, "Psychology of the Insane," which heads the second section, speaking individually, is a misnomer. The insane have no special psychology. The psychological variations in the mentally disordered is one thing, but to assume the "insane" to be a special group with a special psychology does violence to fundamental principles of logic and biology. The special discussions by the author in this section are excellent. We are critical solely on the point of view and what to us is the wrong use of word symbols.

The main body of the work next claims our attention. At last some Kraepelian leaven has entered English psychiatry. It has not yet had time to leaven the whole lump, but Stoddart has gone over boldly into the Kraepelian camp, at least with his standards and symbols, even if he at times seems to lag behind in the understanding of the symbols he uses.

He has seen fit to separate, *i e.*, physically, in his chapters, the exhaustion and intoxication psychoses, notwithstanding their close alliances, and apparently has omitted the infections.

The reviewer feels that Stoddart has not yet completely grasped Kraepelin's idea of the manic-depressive group, although a praiseworthy attempt has been made. This is in deference probably to the extreme conservatism of his environment that cannot get away from the symptom pictures of mania and melancholia. It would seem that Kahlbaum's masterly essay on "Gruppierung der psychischen Krankheiten," written in 1863, should be translated into the English language in order to wrench the psychiatric mass from confusing symptom pictures with disease processes. Our old friends, intermittent and periodic insanity, still crop up, like the shades of Arnold, of Porrect, of Pinel and the rest, not to mention forgotten worthies of the eighteenth century.

Dementia præcox is more Kraepelian; the group is older and more coherent than the manic-depressive group, and can be better formulated. Stoddart follows the usual subdivisions: (1) Simple dementia præcox (the heboids or heboidophrenia of Kahlbaum's), (2) hebephrenia, (3) catatonia and (4) the paranoid types of Kraepelin. The chapter is excellent, even if didactic, perhaps a feature which in a text-book should not call

for adverse criticism. Stoddart is a fairly warm advocate of the syphilitic origin of paresis. This chapter is very satisfactory. Ford Robertson's researches are given in extenso. We miss, however, any discussion of the diagnosis which experience has shown is extremely difficult in at least 10 per cent. of the cases.

Alcoholic insanity has a separate chapter. Why not the alcoholic insanities? alcoholic psychoses? There is not one, there are half a dozen.

Babinski's conception of hysteria is presented but not rigidly adhered to. Janet's psychasthenia is thought of as a reality, neurasthenia is conceived of in the ordinary way. Not a breath of suspicion of the Freudian psychology is found in these chapters.

Space does not permit a more extended analysis. Taken as a whole the book is very creditable. We miss the sense of any historical perspective in the author's rather categorical presentation. The development of psychiatric ideas is one of the chief charms of this branch of medicine, and at the same time a corrective of a too dogmatic statement of views. Perhaps it is too much to ask in a work of this kind. We commend it most cordially. As practically the first English text-book to show adequate comprehension of comparatively modern German psychiatry it should find many friends—in American psychiatric circles.

JELLIFFE.

QUAIN'S ELEMENTS OF ANATOMY. Editors: E. A. Schäfer, Johnson Symington, Th. H. Bryce. Vol. III, Part I, Part II. By E. A. Schäfer and J. Symington. Eleventh edition. Longmans, Green, and Co. New York.

In the eleventh edition of this well-known anatomy we find the nervous system described in two volumes. Part I contains the general structure of the peripheral system and the structure of the brain and spinal cord, Part II contains the descriptive anatomy of the peripheral nerves and the organs of special sense.

Very few of our readers need to be told of Quain's anatomy. To say that there is here a complete and thorough revision, particularly in the histological chapters, is enough. The work of Cajal is very largely used throughout.

These are thoroughly reliable and useful volumes on the anatomy of the nervous system.

BROWN.

KURZER ABRISSE DER PSYCHOLOGIE, PSYCHIATRIE UND GERICHTLICHE PSYCHIATRIE. Für Juristen und Mediziner, besonders jüngere Psychiater. Von Dr. Max Dost, Hubertsburg. F. C. W. Vogel, Leipzig. 4 Marks.

This short monograph of 148 pages contains one of the best short accounts of methods of conducting psychiatric investigations for medical and medico-legal purposes which we have seen for some time. It is not as elaborate as Sommer's schemes, but is very practical and useful.

After an anatomical and physiological introduction, four chapters on psychopathology are given. Then follow chapters on the etiology of the psychoses and the most important forms. An excellent chapter on diagnosis of mental disorders by means of the modes of expression and types of conduct is particularly to be commended as well as that on methods of testing the psychical functions. Therapy, mental diseases and the state are the closing chapters. It is well worth while.

JELLIFFE.

The Journal OF Nervous and Mental Disease

Original Articles

SOME OBSERVATIONS ON AN ISOLATED CASE OF FAMILY PERIODIC PARALYSIS¹

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In May, 1908, I presented to the Connecticut Medical Society a preliminary report on an isolated case of family periodic paralysis, of which the following is a summary:

In August, 1907, a boy, Z, then 13½ yrs., of age (with a rheumatic heredity on the father's side and an intense neurotic heredity on the mother's side), undersized, anemic in appearance and an excessive meat eater, retired as usual one evening after having been lying about on the damp grass; he awoke at about 4 A.M., unable to move a single limb; this condition passed off in the course of several hours. Subsequent attacks occurred on November 2, December 1, January 15, February 12 and 29, March 11, 14, and 22, April 2 and May 12, 1908. The shortest interval between attacks was three days and the longest some three months, this being between the first and second attacks. The paralytic phenomena varied in the several attacks from moderate paraparesis to a more or less intense quadriplegia. In one attack there was for a time complete paralysis of all four extremities which soon however moderated so as to permit of flexion of toes and fingers; his neck muscles were also frequently involved, so that he was unable to hold his head erect. The deep reflexes were diminished or lost according to the intensity of the paralysis; the paralysis was always a flaccid one. Electrical responses also disappeared *pari passu* with the loss of muscular power, being lost in the nerves and muscles of the limbs and

¹ Read at the Regular Meeting of the New York Neurological Society, November 9, 1909.

sections of limbs when these were completely paralyzed, and enfeebled when and where there was a paretic condition. The muscles of organic life were apparently uninvolved. There was no impairment of sensation; tactile, pain, temperature and postural sensations being normally perceived. The accessory respiratory muscles were involved in some attacks as shown by the abdominal type of respiration on forced deep breathing.

Other interesting and peculiar features are the time of onset, between 1 and 5 A.M., the duration of the attacks, from 6 to 36 hours, the normal condition rather speedily restored after an attack and the normal electrical responses shortly before and shortly after an attack. Rather profuse perspiration accompanied some of the attacks and some spells could be aborted by muscular exercise. I could make out no cardiac dilatation at any of my visits, though this feature is much commented upon by several reporters. Since the above report was made and up to the present time, there have been, in addition to the three attacks in 1907 and the nine reported in 1908, nineteen others in 1908 and twenty-two in 1909 to date, making a total of fifty-three in two and a fourth years or fifty-two from November 1, 1907, to November 1, 1909. There have been as many as five attacks in one month and as few as one and even none in some months. Some of these attacks have been preceded on the previous evening by aching and stiffness in the calf muscles. In some mild attacks the hands and feet only were affected and the hands or feet unequally at times. An interesting observation was made on February 2 of this year. The patient had a mild attack, coming on later than usual, about 6 A.M. There was paresis of all four extremities; he could extend his hands at the wrists but the muscular power was feeble; flexion of the feet at the ankles was also feeble and more so in the left leg than in the right; galvanization (cathodal) of the right external popliteal nerve produced extension of the great toe and contraction of the peronei muscles while the same strength of current to the same nerve in the left leg produced contraction of the peronei only, the great toe remaining immobile, the tibiales not contracting in either leg. One might infer from this that the lapse was in the periphery rather than in the cord as in the latter case muscles functionally associated are apt to be affected at the same time; at 3 P.M. the boy was well again. That improvement does not progress equally in various muscles was evidenced in a fairly severe attack on February 17, beginning at 3.30 P.M.; at 7 P.M. he had regained the use of one hand while the other was still feeble though improving.

On March 12 he had a mild attack affecting the feet only; on April 9, the two feet and the left hand only were affected; on May 1 he had a very mild attack in which he ached all over, something which he had never done in an attack before; on May

11 the attack came on about 2.15 A.M., and his mother stated that she noticed on the previous evening, as she often did before, a pallor about his nose and mouth, a drawn expression; he also complained of a crawling sensation in the small of the back; the facial nerve reacted promptly to the faradic current, which was contrary to the experiences of Waterman, of Boston, in a case of this kind. In this attack, the arms and forearms were paralyzed except in the ulnar distribution; he could deviate his wrists to the ulnar sides but not to the radial sides of the forearms; this was a severe attack of more than twenty-four hours' duration. In some attacks the hands were more severely affected than the feet and vice versa, while sometimes the feet only and at other times the hands only were affected. His mother said that the bowels never moved during an attack, and that he usually passes urine at much longer than normal intervals when he has an attack; also, while paralyzed he feels tired and wants his limbs moved from place to place occasionally. His parents state that massage always makes him worse, while a laxative, such as castor oil, administered when he notes the usual prodromata, sometimes prevents the attack. They also connect the attacks with antecedent exercise or errors in diet: For instance, on January 2 he exercised much, on January 3 he ate salad in the evening and was up late; on January 4 he had an attack. February 17, an attack; was constipated on February 16; March 1, an attack, was up late, until eleven o'clock on the preceding evening. On May 1, an attack; was out in the rain on this and the two preceding days. July 29, an attack; played ball a little yesterday. They have also attributed attacks to bicycle riding.

Cases of this disease have been reported in this country by Taylor, Burr, Rich, Putnam, Mitchell (J. K.), Crafts, and Holtzappel. Dr. C. A. Dana recently told me that he had had a family group of three cases. While the prognosis of this disease has been uniformly considered as favorable, the attacks ultimately ceasing toward middle life, Taylor has reported one fatality in a man of 53; he places this among the doubtful cases however for reasons other than age. On the other hand, Holtzappel reports six deaths, in attacks, in one family, 17 of whom suffered from this affection with 17 cases of periodic headaches in the same family; he states that five cases of this affection have been reported in Great Britain.

There were a number of interesting observations made upon this boy which may be worthy of mention. When a specimen of blood was taken from the ear, clotting took place so rapidly that it was with much difficulty that the pipette could be drawn full

of the fluid. Dr. J. K. Mitchell reports a similar experience. I shall revert to this again later on. Blood count and hemoglobin were normal.

An examination of the digestion of the patient in the interval between attacks also showed an abnormality.

He was placed upon a moderate diet of fine chopped beef, bread and butter, potatoes and eggs, etc., a liberal diet but free from vegetables and fruits, which might leave a residue of vegetable fiber in the feces. After being on this diet for six or eight hours, he was given 10 grains of lampblack or soot. Such a diet should, if all of his secretions were normal and digestion properly performed, give feces free from fats, starches, muscle-fiber and connective tissue, as these are all normally disposed of in the digestive tract. The stools following the ingestion of this diet and its lampblack should, when passing through and colored black, show, when rubbed up with water, simply a muddy fluid. This diet and these examinations were pursued for three days and each of these days revealed identically the same condition of the feces, namely, absence of starch, fats and muscle fiber, showing that intestinal digestion was properly performed and so far as absence of muscle fiber is concerned, that gastric digestion was normal. The water-triturated black feces however did show something that should not have appeared with normal digestion of this diet, and this was numerous flakes of some solid substance which when washed appeared to be either mucus or connective tissue shreds. Under the microscope this is plainly shown to be connective tissue, and this is further proven to be so by the fact that these washings will swell up and become transparent while mucus will shrivel when placed in a solution of acetic acid. Here then is one factor in this boy's economy that is wrong. His gastric digestion is imperfect in that he is unable to care for the connective tissue that he consumes in his meat. How much this has to do with his attacks of paralysis we do not yet know; it is possibly a factor though not *the* or the only one. Such a series of investigations has not heretofore been made in any of the reports of cases that appear in the literature up to the present time.

Some two or more years ago, MacCallum brought out the fact that in cases of thyroidectomy with removal of the parathyroids, tetany results; when the parathyroids remain, the tetany does

not appear. Furthermore, this tetany (experimentally produced) may be made to disappear temporarily by the introduction into a vein or subcutaneously of calcium salts (these being deficient in the blood after the animals had been operated upon); that after a while the tetany returns to be again more or less permanently relieved by the calcium injection. "Apparently the parathyroid secretion influences the calcium exchange in the body, perhaps because, in the absence of this secretion there develop, abnormally, products of metabolism which combine with and extract the calcium from the tissues. 'The mechanism of the parathyroids is not determined, but the result, the impoverishment of the tissues with respect to calcium and the resultant hyperexcitability of nerve cells and tetany is proven.' Tetany therefore would seem to be, in many cases, the expression of a hyperexcitability of central nervous tissues due to withdrawal from them of calcium, and this may be due to *defective* supply, or *excessive elimination* on account of thyroid incompetence, or of a drain on *calcium supply* for *physiologic purposes* or because of *abnormalities* in calcium metabolism."

Calcium salts check tetany which is due to increased excitability of the central nervous system.² Twitchings may be produced by any salt liable to precipitate calcium (Loeb) and hence calcium salts used in spasmodic affections.

Sabbatin found that calcium salts locally applied reduce the irritability of the cerebral cortex; and this irritability is increased by the application of substances which precipitate calcium. MacCallum and Voegtlin have shown³ that in animals after parathyroidectomy there is an increase of elimination of calcium in the urine and feces, and hence much less than the normal amount of calcium in the tissues especially in the blood and brain. Quest says that in tetany the calcium content in the brain is lowered.⁴

These then may be called cases of operative or artificial or induced hypertonicity or spasticity or tetany. In the cases of periodic paralysis there is a condition of flaccidity or hypotonicity or anergy or inhibition; possibly (in view of the above related experiments of MacCallum) an excess of calcium salts in the blood or muscles due possibly to overfunctioning of the parathyroids.

² Jour. Am. Med. Ass., January 30, 1909.

³ Jour. Exper. Med., 1909, XI.

⁴ Jour. Am. Med. Ass., January 30, 1909.

However, without anticipation on our part, I requested Professor Lafayette B. Mendel, of Yale University, who conducted the examination of the digestive apparatus, to investigate the urine in order to see what that might show. This was not reached until this year when the following was revealed. The accompanying table shows a series of examinations of the urine, undertaken last winter, i. e., since the earlier paper was written, the urine being in every case the total passed in twenty-four hours. The first thing that strikes the eye is the presence of creatine, and that in not inconsiderable quantities. Creatine, as many of you doubtless know, is never found in the urine of normal individuals except in cases of pregnancy. This patient exhibits it constantly. As a control, a healthy boy of the same age was taken and his urine found free of creatine. What bearing this may have upon the case we do not know further than that it may have something to do with muscle substance.

Next we note the quantities of calcium and magnesium. Tables from various investigators give the average normal output of calcium as 0.12-0.25 gm. of the former, and 0.18-0.28 gm. of the latter, and some give even higher percentages. Here then is a defective elimination of these salts and this at a time when the boy was not on a restricted diet and even when drinking more or less milk.

There also appeared at this time a positive reaction in tests for protein (there were no casts) and in two instances for proteose, i. e., like a Bence-Jones albuminuria, as is found in cases of osteomalacia.

Of the nature of periodic paralysis nothing is known and we have nothing but speculation and theorizing by all investigators. It seems to me that of all men who have written upon this disease, Dr. J. J. Putnam comes nearest the truth when after a review and analysis of the literature he states that he is led to believe that inhibition plays a prominent role in the development of the symptoms and also likens the paralytic phenomena to those produced by curare. The observations described in this paper are in line with that view. Magnesium salts have been shown by Meltzer and others to exert marked inhibitory effects upon the conduction of nerve impulses and upon the reflexes, and they have been used clinically for such purposes. The table shows a striking diminution in the amount of magnesium salts eliminated by the urine,

URINE EXAMINATION

Date 1909.	Volume cc. in 24 hrs.	Sp. Gravity.	Creatinine. gm.	Creatine gm.	CaO gm.	MgO gm.	Protein test.	Remarks.
Feb. 7	567	1,015	0.486	0.108	0.030	0.099	+	
8	1020	1,016	0.819	0.195	0.052	0.154	+	(proteose-like)
9	1000	1,013	0.719	0.254	0.037	0.006	+	"
10	850	1,012	0.775	0.222	0.034	0.061	+	+
17	450	1,023	0.661	0.403	0.155	0.197		traces
18	540	1,014	0.368	0.146	0.038	0.022	+	+
21	765	1,021	—	—	0.024	0.025	+	(proteose-like)
26	275	1,024	0.468	0.075	trace	0.002	+	+

hence possibly retention in the blood or muscle and hence inhibition at such times when the resisting power is lowered. In my original paper I referred to the relief, by injection of calcium salts, of the tetany produced by the removal of the parathyroids. I considered the possibility of an excess of the calcium salts in the blood or muscular system possibly due to overfunctioning of these structures. Since then this series of urinary examinations has been carried on and it certainly seems to lend support to that view, the calcium excretion being strikingly diminished. Another phenomenon pointing in the same direction is that of the rapid coagulation of the blood in this and in Mitchell's case, calcium salts being considered now as promoting blood coagulation. In my former paper, I had considered the calcium salts solely, but now when we find both magnesium and calcium, two elements, each of which when acting alone capable of inhibiting the conduction of nerve impulses, when we find both of these eliminated in markedly diminished quantities, there seems to be some ground for believing in the theory of their retention in undue quantity and for their exerting an inhibitory effect upon muscle tissue and peripheral nerve endings in a susceptible individual. To Dr. Lafayette B. Mendel, professor of physiological chemistry, of the Sheffield Scientific School of Yale University, I wish to express my indebtedness for the examinations of the urine and feces as well as for many valuable suggestions as to lines of investigation and references.

ADDENDA

F. Z. Feb. 28, 1909. Height, 4 ft. 11 $\frac{3}{4}$ in. Weight, 97 $\frac{1}{2}$ lbs.
 Nov. 7, 1909. Height, 5 ft. $\frac{3}{4}$ in. Weight, 100 $\frac{7}{8}$ lbs.

Therapy.—Dr. W. G. Spiller, in a case of myasthenia gravis, in which there was an excess of calcium in the urine, gave calcium chloride with improvement.⁵ J. K. Mitchell's patient took potassium citrate and by this means cut short the individual attacks.

Citric acid delays the coagulation of the blood⁶; a prolonged trial of lemon juice in large quantities had no effect upon the return of attacks in my patient. Josephs and Meltzer successfully experimented with physostigmin in neutralizing the toxic effects of magnesium salts. A single dose of this drug hypodermically administered to my patient during an attack had no effect.

⁵ JOURN. NERV. AND MENT. DIS., July 11, 1908.

⁶ Jour. Am. Med Ass., March 3, 1909.

ANESTHESIA AND THE LACK OF IT IN THE DIAGNOSIS OF SPINAL CORD TUMORS

BY PEARCE BAILEY, M.D.,

NEW YORK

Some loss of sensibility in the skin is a regular symptom and is second to pain in the order of development. By the time that pain has acted in a way to arouse the suspicion of spinal cord tumor, some anesthesia is usually demonstrable. It may at first be a root symptom, found in the same areas as are the seats of pain. Thus, in early cervical lesions, a strip of anesthesia in one or both arms, or in dorsal lesions, a patch on abdomen, chest or back, may be the only losses of sensibility which exist. In other, and in perhaps the majority of cases, the anesthesia is segmental from the first. The Brown-Séquard type is very frequent. Anesthesia occurs in cases without pain. Its constant tendency is to deepen, the rapidity of deepening depending on the rapidity of the cord compression. Except when following a radicular distribution, it deepens most in distal regions, so that an anesthesia which is profound in the feet, may, at its upper limits, be nothing but an inability to recognize the lightest touches. There may be pronounced anesthesia in a root area at the base of the tumor, below which the skin is normal or hypesthetic, and then pronounced anesthesia again in lower extremities. Esser¹ reported a case in which a tumor under the first and second dorsal vertebrae caused the girth sensation. It is unusual to find in spinal cord tumors the sharply marked upper boundary which is common in myelitis and almost constant in severe traumatic lesions. Like pain, anesthesia may recede from day to day or from week to week. But, unlike pain, once established it rarely disappears entirely. Extreme fluctuations in the degree of anesthesia should excite the suspicion of multiple sclerosis, and a rapid climbing upward of the superior anesthetic limit speaks in favor of intramedullary tumor. All these qualities of anesthesia are usually involved together, though slight losses to tactile sensibility are more certainly demonstrable than slight losses to ther-

¹ Deutsch. Zeit. f. Nerv., Vol. 32, 1907, p. 118.

mic or pain sensibility. Sterling² believes that sensibility to vibration is the first variety to be lost. The anesthesia may be disassociated in that touch is present, but pain and temperature senses are interfered with. Under these conditions, the anesthesia areas are apt to be irregular in distribution and uncertain in outline. In spite of Schlesinger's protest in 1890, the view is still widely held that such a disassociation of sensation is a strong indication, if not a final proof, that the tumor is within the cord itself. I am convinced that this view is fallacious and that disassociation alone justifies no conclusion as to the situation of the tumor. Caries and tumors of the vertebræ as well as extra-medullary tumors frequently give just this symptom; and centrally situated tumors on the other hand may give total anesthesia or loss of touch with preservation of thermic and pain sensibility. It seems highly important that the authority so long ceded to dissociation as a contra-indication to operation be now called into question in every case; and that only such weight be given it as is justified by its association with other symptoms and by the method of its development.

Interference with tactile sensibility is the commonest variety of anesthesia and the most reliable for purposes of localization. This is often present as a faint hypesthesia and may be so slight as to require a painstaking examination to demonstrate it. In two of my operated cases in which such a hypesthesia was the only means of localization, the patients were sent in as having no anesthesia whatsoever. To examine for hypesthesia no esthesiometer made equals the finger tips. With them there can be no confusion through differences of temperature and the amount of pressure employed can be practically constant. Running the finger of one hand lightly over the portion of the skin suspected of anesthesia and the fingers of the other hand over a part presumably normal, the patient is asked if he feels better in the one place than in the other. Slight variations in acuity, if in accord with other symptoms, may be trusted. Even less pointed evidence may be accepted provided the patient is well oriented and intelligent. Under the latter circumstances, I do not fear to trust the answers even when they are no more positive than that the sensation is "different"—often no more exact word is found—in the suspected areas than in the normal ones. In one of the

² Deutsch. Zeit. f. Nerv., VI, 28.

cases just referred to, a tumor was correctly localized at the ninth dorsal vertebra when the only focal sign was a line across the abdomen below which the sensations aroused by touch were "indescribably different" from those above the line.

Certain clinical experiences in the past few years led me to enquire if a tumor of the spinal cord could be diagnosed with reasonable certainty in the absence of anesthesia of the skin. I cannot say that in my search through literature no case has been overlooked. I have carefully investigated all the cases ordinarily accessible. As a result of this task it appears that no tumor of the spinal cord can be diagnosticated with sufficient certainty to justify operation if cutaneous sensibility is intact. The one fact I found in opposition to this view was an observation by Forbes.³ Forbes reported the case of a child, who died of the effects of an intramedullary tumor in the cervical region. There was "no anesthesia" though it was not stated what methods of examination were employed. In view of the child's age and the brevity of the report, it would be unwise to let this case nullify the conclusion drawn from so many others.

To prove that such a guiding rule may be of great importance, I will briefly outline three cases in which many things pointed to a tumor being present, but in which the subsequent course proved that in all probability there was no tumor, and certainly that operative interference would have resulted in nothing but embarrassment to those recommending it.

CASE I.—A woman, 53 years of age, whose husband had had syphilis, but who herself had never given any of the symptoms of syphilis, had an attack of pain in the left leg in 1900, which lasted several months, but which finally disappeared. In January, 1904, when I first saw her, she had been suffering from pains in the left lower extremity. These pains were distributed around the ilium, on the front and outside of the thigh, and on the anterior and outer surface of the leg.

The pains were induced by movement especially, were cramp-like and came in attacks which lasted from a few seconds to several minutes. They left the parts very sore. The left knee jerk was absent while the right one was active. The pupils responded promptly to light, the sphincters acted normally. Repeated and careful examinations showed absolutely no anesthesia. The patient suffered severely for some months. There was no loss of motor power, although walking was impossible on account of the

³ St. Bart's Hosp. Reports, XLI, p. 221.

pain. She lost much sleep, and morphine was the only drug which relieved the pain. The left calf soon showed an atrophy of one half inch, and at about the same time, the right knee jerk also disappeared. There was now added a sensation of burning in the left foot. Throughout the disease, the patient complained of points of special tenderness over hip, thigh and tibia. At times, we thought we could feel small subcutaneous nodules in these places. There was no sensitiveness of the spine. A number of neurologists saw this patient without reaching a definite diagnosis. All agreed that tabes and tumor of the pelvis could be excluded and that a neuro-fibromatosis of the lumbar and sacral roots explained, better than anything else, the symptoms. Even this diagnosis became extremely doubtful, as in April, 1904, the pain became very much better, the knee jerks returned, and the patient began to walk again. From that time until the present (February, 1909), the patient has had no severe pain. The right lower extremity remains as a *locus minoris resistentiae*, becoming somewhat sensitive and uncomfortable as a result of over-fatigue. The painful nodules have never reappeared. There is now no atrophy, the right knee jerk is present, but the left one is still absent. There is full functional use of the limb.

CASE II.—Woman, 43 years of age, seen in June, 1907. Syphilis denied. The patient had always been well until several months before, when she began to have pain in the left leg. This was at first in the sciatic distribution but later involved the front of the thigh with hyperesthesia of the outer side of the left foot. At the time I saw her she was confined to bed and was in so nervous and excitable a state, partly due to the morphine that had been found necessary, that satisfactory examination was impossible. I found, however, that the left lower extremity was atrophied (1 inch in the thigh); that the left knee jerk was absent, and that the muscles responded sluggishly to galvanism. Urine had been voided involuntarily once, perhaps by reason of the nervousness. There was no anesthesia and no sensitiveness of spine or sacrum. The patient was sent to the hospital for observation and possibly for operation. Fortunately for all of us, the pain began to improve at once and in six weeks she was able to return home with laminæ intact. She still suffered pain on movement and was not able to walk without crutches until November. From then on she slowly recovered until now (February, 1909), she has been entirely free from pain for about nine months and has full functional use of the leg. The knee jerk has returned and the patient is in excellent health. All that remains of her illness is a one-fourth inch atrophy of the left leg and a hyperesthesia of the outer side of the foot on the same side.

CASE III.—A man, 70 years of age, in August, 1898, began to

have severe pain in the rectum and peri-anal region. At the same time, he had a painless giant-celled sarcoma of the right superior maxilla which Dr. Abbe operated on in November. Two weeks after this operation, when I saw him, the rectal pain was even more severe, causing much loss of sleep and general nervousness. My examination showed practical loss of both knee jerks and fibrillary twitchings of the glutei muscles without any other spinal symptoms. No tender points and no anesthesia. In view of the existence of the sarcoma, the diagnosis of a metastasis in the cauda equina seemed justifiable. Subsequent events did not bear out this assumption, as the pain suddenly stopped completely.

Whatever may have been the diagnosis of these three cases they plainly proved by their subsequent course that they were not tumors of the spinal cord which merited operation. The chief point of clinical difference at the time the symptoms were at their height was the absence of anesthesia. In all, one or both knee jerks were lost and the pain was the exact counterpart of pain as it may occur in tumor; in two, there was distinct local atrophy; in one there was fibrillary twitching. In none was the spinal complex complete; sphincter paralysis was absent and paralysis was slight or wanting. But these symptoms frequently are missing when the tumor is demonstrable. Not so anesthesia. And consequently, it seems as though absence of anesthesia should constitute the final contra-indication to operation.

To this general rule there is one notable exception, namely, the tumors of the cauda equina growing in the sacral canal. These slowly growing and excruciatingly painful tumors can exist for months or even years without interfering with sensibility. A number of such cases successfully operated upon, are on record.⁴ In all of these pre-operative diagnosis was certified to by excessive tenderness and sensitiveness in the sacrum, demonstrable by pressure externally and per rectum. This latter symptom, namely, bone tenderness, is so pronounced in these cases that the patients cannot lie on their backs or stand the slightest jar without extreme pain. The bone tenderness is so characteristic that it in itself is almost sufficient to justify the diagnosis of tumor. Coupled with some spinal symptoms, the diagnosis is certain even in the absence of anesthesia.

⁴Laquer, *Neur. Centralblatt*, 1891, p. 193; Schmott, *Am. J. Med. Sc.*, Vol. 131, p. 133; Kummell, *Arch. f. kl. Chir.*, L, 451.

THREE CASES OF SPINAL CORD TUMOR OBSERVED WITHIN A PERIOD OF TEN DAYS; OBSERVA- TIONS ON THE BEHAVIOR OF THE CERE- BRO-SPINAL FLUID¹

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Cases of spinal cord tumors are not so numerous but that variations from the normal symptomatology and unusual results or experiences are worthy of publication, and the experience which the author had in March, 1908, is unique from the viewpoint of frequency of these cases.

On March 5, 1908, August G., Case 1, was brought to the Buffalo General Hospital for observation and treatment, suffering with symptoms pointing to an intra-spinal tumor. On March 10, 1908, a laminectomy was performed, and a tuberculoma was removed from the fifth thoracic segment of the cord.

On March 15, 1908, the writer was called to see a patient (Case 3) in consultation with Dr. Richter of Buffalo, and on careful examination a condition of spinal cord compression was diagnosed, due undoubtedly to a spinal cord tumor, and patient urged to be sent to the Buffalo General Hospital.

On March 20, 1908, the writer was asked by Dr. Roswell Park to see a patient in the Buffalo General Hospital, suffering from spinal cord disease, probably tumor. The patient, Bersley P. (Case 2), after several examinations was found to be suffering from a spinal cord tumor at the level of the tenth thoracic segment. A laminectomy was performed by Dr. Park, March 28, 1908, and a small round cell sarcoma was removed from the tenth and eleventh segments of the cord. While this operation was in progress, Case No. 3, Mrs. Elizabeth J., was being brought into the Hospital, and on announcing the fact to Dr. Park, he laughingly remarked that we might bring her at once into the operating room and have a spinal cord tumor clinic.

The patient was sent to the ward, and on March 25, 1908, was prepared for operation. Her condition after taking her to the anesthetizing room was such that an operation could not be per-

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formed, at that time, and she was returned to the ward. A lumbar puncture was later performed and on April 12, 1908, the patient died. Autopsy revealed an encircling carcinoma at the level of the first thoracic segment.

Thus from March 10, 1908, to March 20, 1908, three cases of spinal cord tumor were under observation, two of which underwent operation and one a lumbar puncture followed by autopsy, an experience which has not been equalled before in the study of these growths. The medical histories follow:

CASE No. 1.—Name, August Gardei; occupation, wood-working machine hand; admitted, to Buffalo General Hospital December 26, 1907; age, 36; nativity, American; complaint, general weakness, pain in left side of chest.

Family History.—Father died of old age, at 82. Mother is living and well at 65. Five brothers are living and well. Three sisters are living and well. One brother died of typhoid fever at 44. No history of tuberculosis, cancer or rheumatism obtainable. Three children living and well. Wife has had no miscarriages.

Personal History.—Had measles, mumps and whooping cough in childhood. Never had scarlet fever, diphtheria, pneumonia, rheumatism, smallpox or malaria. Had slight attack of pleurisy in summer of 1907. Had typhoid fever in 1892; was sick in bed about four weeks. Had influenza in spring of 1907, and since that time has been unable to do anything, because of general weakness and pain in various parts of body. Has been hard of hearing in right ear since having had grippe. Health was good up to attack of grippe. Six or seven years ago he had an operation for what was probably an hydrocele of left testicle. Last spring the right one began to be similarly affected. About one month ago, the left one again seemed to be enlarging. Denies all venereal history. Normal weight 135 to 140 lbs. One month ago (November) weighed 117 lbs. Most of weight has been lost since early in summer of 1907. Drinks moderately. Smokes and chews tobacco some.

Present Illness.—Since about December 1, 1907, patient has been growing markedly weaker. He has pain in left chest, especially when lying down, and upon deep inspiration. During past summer, patient had frequent night sweats and since December 1, 1907, he has had profuse night sweats every night. Has no special cough. Bowels are constipated. During past two weeks, nothing but an enema would prove successful.

December 26, 1907: Physical examination shows fairly well developed, but poorly nourished man. Pupils react normally. Tongue coated with grayish fur. Chest shows poor expansion throughout; less on right in supra and infra-clavicular regions. Fremitus increased over right supra and infra-clavicular and axillary regions.

Percussion.—Higher pitched note in supra-clavicular, and slightly higher pitched note in infra-clavicular region on right side, also in right axilla. Broncho-vesicular breathing in right supra- and infra-clavicular regions; prolonged expirations and few fine crepitant rales right axilla; expiration high in pitch and prolonged; sibilant in character.

Posteriorly.—Fremitus increased slightly at right supra scapular and markedly so at right infra-scapular region. Breathing sounds distant in right supra scapular, and respiration high in pitch and prolonged. In right inter-scapular region, pleuritic friction is heard opposite the fourth and fifth vertebræ. Whispered pectoriloquy present in right supra-scapular region.

Heart.—Normal in size and position. Apex impulse seen in fifth interspace just inside nipple. First sound clear and distinct, not accompanied by murmur. Base; second aortic sound accentuated over second pulmonic.

Liver.—Dullness begins at fifth rib and extends 3 inches below the free margin of the ribs. Patellar reflexes are exaggerated, ankle clonus and Babinski are present.

December 27, 1907:—Heart apex is diffuse—in fifth space from one eighth inch to left one fourth inch to right of nipple line. First sound is a little short. Second pulmonic sound is accentuated. In the left supra-clavicular region there is impaired inspiration, and prolonged heightened expiration. Increase in vocal resonance, and somewhat approaching broncophony in quality.

Posteriorly there is a decided winging of the scapulæ, particularly of the left.

Dullness on left side in supra-scapular, scapular and inter-scapular regions. Impaired in left infra-scapular regions. Right side; impaired respiration in supra-scapular, scapular and inter-scapular regions. Good resonance at base. On left side, breathing is dim throughout, with prolonged high pitched expiration.

On right side in supra-scapular region, the breathing is bronchial in quality. In infra-scapular, it is exaggerated. Epididymis on each side is very hard and large. Glands in groin are somewhat enlarged, also down along Scarpa's triangle. Suggestion of ankle clonus. Knee-jerk quick. Some crepitus in left knee joint on flexion; less in right knee.

December 29, 1907: Blood examination shows hemoglobin 85 per cent., red corpuscles 5,080,000, white corpuscles 7,200.

Differential.—Polymorphonuclears 75 per cent., large lymphocytes 5 and one half per cent., small lymphocytes 14 and one half per cent., eosinophiles 3 per cent., basophiles 2 per cent.

January 2, 1908: Hemoglobin 85 per cent., red corpuscles, 4,265,000, white corpuscles, 5,700.

January 3, 1908: Fluoroscopic examination shows two distinct areas of shadow in the left chest. Right chest is clear. Left

chest is slightly darker over upper lobe than on the right side same point.

Patient returned to his home unimproved January 3, 1908, after a period of two weeks. The bowel movements became involuntary. A few days later he lost control of the bladder, and the urine passed involuntarily. The legs became suddenly weaker, and the pain in the lower part of the body and right leg increased in severity. He was seen by Dr. E. R. McGuire early in March, who suspected some spinal cord disease, and induced him to re-enter the Buffalo General Hospital March 4, 1908.

ABSTRACT OF CLINICAL REPORT BY DR. E. R. MCGUIRE

"The patient was first seen by me at his home in a neighboring city. He was confined to his bed, and although he was completely paralyzed, I was consulted because of a phlegmon on his back. He ascribed the loss of the use of his limbs to what was a beginning bed-sore.

"As I proceeded to secure a history, he asked his friend to bring some papers from another room, which, upon examination, proved to be a complete hospital record, which he had taken with him when he had left the institution the preceding week. The record was quite complete, showing that at that time his sputum contained tubercle bacilli; physical signs of trouble in the right apex, and a continued and progressive loss of weight. Upon returning home he complained of vague disturbances in his limbs. As if they were asleep, as he expressed it. This gradually progressed until complete loss of motion ensued. Later, about two weeks before I saw him, he lost control of his bladder and rectum."

At Dr. McGuire's request I examined the patient on March 5, 1908, and found the following conditions:

Patient was pale, weak, emaciated, lying upon his right side, complaining of a great deal of pain over the chest, especially the left side which had defied all manner of treatment for many months. Movement of the body did not seem to aggravate the severity of the pain, and patient was as comfortable on his left side or back as on his right side. Inspection showed the legs drawn up, flexed at the thighs and knee joints, and atrophied to a very marked degree; there was no difference in measurements between the right and left leg—both were practically reduced to skin and bones. The muscles of the arms, however, were quite well preserved, and not wasted to the extreme which characterized the lower extremities. Some slight degree of stiffness bordering on contracture was present in the legs. The abdomen was flattened; urine and feces were passing involuntarily. No bed sores were present. Testing the muscular strength of the legs gave an absolute negative result. No motion of any kind could be detected from the chest caudad whatever.

Reflexes.—The patellar tendon reflexes were slightly exaggerated. Ankle clonus was slightly exaggerated. Patellar clonus was absent. Babinski's reflex and plantar reflexes were slightly present on both sides. The cremasteric and abdominal reflexes were absent.

Testing the skin for sensation revealed an anesthesia complete for all forms caudad of the intermamillary line. The ventral level was quite sharply defined, but the dorsal level was marked by a zone one and one half inches in width, in which the differentiation was less marked. In this zone of uncertainty the patient would be unable to distinguish between sharp and dull objects; would give contradictory answers, and on successive examinations would interchange the anesthetic, hypesthetic and normal areas.

Examination of the spinal column elicited by deep pressure a sensitive area over the third to fourth thoracic spinous processes. No deflection or deformity of the spinal column could be detected.

On his first stay in the hospital the temperature on three occasions rose above normal; the pulse ranged from 80-90, while the respirations continued 20. Urinary examinations showed absence of albumin and sugar, normal specific gravity, and occasional leucocyte and granular cast. On the second stay at the hospital the temperature rose above 100° F. on two occasions, and the pulse ranged from 90-100.

Reviewing the clinical history of this case, we find a man without any tubercular or specific history, attacked by the grippe in the spring of 1907, and followed by a weakening of the whole body, pains in the chest, and a slight attack of pleurisy in the summer of 1907; the testicles became involved, he began to lose in weight, and in December, 1907, the process seemed to advance with increasing vigor. With continuous pain, weakness of the legs advanced to such a degree that he was obliged to enter a hospital. A very careful examination of the chest by an experienced clinician revealed a tubercular process in the left lung, which was verified by the radiograph. All attention was paid to the thoracic contents, and as the pain and weakness and loss of weight could be attributed to the chest lesion, no attention was paid to such symptoms as "marked constipation, patellar reflexes exaggerated, ankle clonus and Babinski present." Returning home, the symptoms of cord disease advanced much more rapidly than the chest symptoms; bladder disturbance, rapid loss of strength, increasing weakness of the legs even to complete paralysis, exaggerated deep reflexes and absence of the superficial reflexes, all pointed to a slowly increasing intraspinal pressure; the zone or level of anesthesia at the height of the intermamillary line, and the area of sensitiveness over the third and fourth spinous processes spoke for a lesion at the level of fifth

thoracic segment. Although the patient was not in a very favorable condition for an operation, his relatives were very favorably inclined, and the patient most desirous for any kind of relief. A laminectomy was agreed upon at the earliest possible moment.

SURGICAL REPORT BY DR. E. R. MCGUIRE

"The patient was told of his desperate condition, and little or no hope was given him of recovery. He requested to have something done, however, even with so slight a prospect of success.

"March 10, 1908, an incision was made from the first to the seventh dorsal vertebra. The muscular attachments were easily separated with comparatively slight oozing. The second, third, fourth and fifth spinous processes were removed with rongeur forceps, and the canal opened at the fifth spinous process with hammer and chisel. Then with a Doyen forceps I was able to open the canal from the fifth to the second thoracic spinous process. The dura appeared normal and even palpation of the cord revealed no evidence of tumor. Upon opening the dura, the pia appeared dull and of a different consistency at the second dorsal spine. Closer inspection showed a distinct tumor formation involving the greater part of the interior of the cord. With the blunt end of a pressing forceps, the tumor was shelled out with perfect ease. There was very little hemorrhage at any time. After removal of the tumor there was a small section of the cord still intact. The pia and dura were sutured with plain catgut, and the external wound closed with thread, without drainage. The patient left the table in very poor condition. Continuous salt solution per rectum was immediately started, also a subcutaneous injection of 300 c.c. of salt solution containing .60 per cent. of adrenalin chloride. The patient failed to rally, and died one hour later. We obtained permission to re-open the wound, and the cord was removed and sent to Dr. Simpson for examination."

PATHOLOGICAL REPORT BY BURTON T. SIMPSON, M.D., ASSISTANT TO THE SURGICAL CLINIC.

"The tumor, as received at the laboratory, was two by one and one-half centimeters in size, of very firm consistency. Cut section showed a glistening white homogeneous surface. Microscopically, the periphery showed numerous giant cells, while the central part was composed of a dense fibrous tissue. Section stained with carbol-fuchsin showed a few tubercle bacilli. A section of the cord, at the area where the tumor laid, showed the cord structure completely destroyed, while a section taken about five centimeters below showed complete degeneration of both ascending and descending tracts. Microscopical diagnosis of the tumor is given as tuberculoma."

This case is unusual in that an intramedullary tuberculoma could exist without producing dissociation of sensation. Repeated examinations were made to test sensation, but the patient's answers were always the same.

CASE NO. 2.—Name, B. P.; age, 37; nativity, American; sex male; occupation, teacher.

Family History.—Father's father was a Hollander; does not know about him. Father's mother, does not know about her. Mother's father died of old age. Mother's mother died of old age in Ireland. Father died of pneumonia, age 63. Mother died of liver disease, age 66; perhaps heart disease. One brother, age 40, is healthy. One sister, age 42, is healthy.

Personal History.—Had scarlet fever and all infantile diseases. Had quinsy, jaundice in 1895; fully recovered. Has had bilious spells since then. Began to teach in 1889, at age of nineteen, and taught ever since. Never used tobacco or alcohol. No history of rheumatism or syphilis. Slight injuries to different parts of the body, without any serious consequences. Began to have tired spells in February, 1907; feet weary, easily tired, wanted to be quiet and rested. Everything was a burden to him, unaccompanied by pain. Legs felt heavy; wearied, hard to walk up-hill or upstairs. The condition seemed to improve when he went to the country, April, 1907, and continued until July, 1907, when he overdid in his farm work, helping to put up a patent fence he suddenly gave out—prostrated without pain. Then afterwards felt about the same until latter part of September. Did not take up school work on account of this tired feeling and prostration. Began in business, but effect was the same, so stopped all work; only drove about—reading and resting. Improved some under these conditions until December fifth or sixth, 1907. Began to have slight pain in the back, lower thoracic region, especially at night, continuing slight for four to five days; then began to be severe at night, but very slight during the daytime. Then had to sleep in sitting posture for a month. About middle of December he began to walk feebly like an old man; could not stand erect on account of pain, which now was of considerable severity—always localized—extending on both sides to lateral line of body, but not anteriorly. Noticed that certain positions of the body would relieve the pain, also that certain body movements would cause intense pain. Not any herpes present, but noticed that abdomen was tympanitic. Was treated for intestinal indigestion and biliousness. Weakness of the legs began to be quite noticeable, the latter part of December, especially in walking. Edema of the legs appeared in January, and upon taking to the bed it disappeared. Seemed to be most pronounced when in sitting posture. Had to be careful in walking so as not to misstep; began to waver and gait became atactic. Pain remained about the same. Appetite remained good; slept

under influence of hypnotic; pain was relieved at night by anodynes. During the day patient was able to get in a comfortable position, and suffered little pain. Patient remained in about same condition all during month of January, with an increasing degree of weakness in the legs. Drove out during the month and walked some, but with difficulty.

On February 2, 1908, a plaster of Paris jacket was applied to "relieve a condition of pressure on the cord, due to an exudate, which was pinching the cord." Jacket was worn two to three weeks, and pain seemed to be better so that no anodyne was necessary at night. Motion of the legs did not improve however, and patient was now obliged to use a cane for support and to steady himself. During this time there was difficulty in starting micturition, patient was obliged to wait a minute or more. The bowels were in good condition however. Patient had a crowding feeling in the rectum, which was under control. No special relief was obtained from wearing the cast, and consequently it was discarded on account of the inconvenience. From this time weakness began to increase and he was unable to walk without use of crutches. March 9, 1908, on getting up from chair, he fell several times. The night before he was just able to go upstairs to his bedroom, and the following morning his feet had to be moved by hand to get him downstairs, step by step. There was absolutely no control over the legs from this time on, and on March 15, 1908, he took his last step. He had several falls during these few days, and no longer ventured to walk even with support. Pain was not so intense as before, and he was able to get along without further use of anodyne. Bladder became slower in response, and bowels remained the same. Legs at times would twitch if certain points were touched. Sense of location in legs gradually disappeared with onset and progress of weakness, and numbness appeared in the legs coincident with the increasing weakness. The edema of the legs would partially disappear during the night, and re-appear during the latter part of the day. Heart, lungs, head, arms and upper part of body remained unaffected.

Patient entered the Buffalo General Hospital on March 19, 1908, after having passed through the hands of various physicians without finding any relief from the conditions as stated. The patient was referred to me for diagnosis by Dr. Roswell Park, who suspected a compression of the spinal cord, due undoubtedly to a tumor.

The patient was first seen seated in an arm chair in a semi-recumbent position. He was unable to arise or stand or to exercise any movement whatever over the lower extremities. The upper extremities, thoracic contents, special senses and mental state were normal. Patient was an unusually intelligent man and able to go into the minutiae of all matters pertaining to his

illness and infirmity. On removing his clothing and placing him in bed, the following conditions were noted: Both legs were edematous extending up above the knees. No bed sores were present, although a slight area of reddening about the size of a silver dollar was found under the sacrum. No contractions or muscular tremor in the legs was noticeable. The abdomen, lower half, was flattened and remained motionless during respiration. The upper half of the abdomen or epigastric region was full, rounded and participated in respiratory movements. Nothing abnormal was noted about the upper half of the body. The muscles of the arms were well developed, and the whole general condition was that of a strong, healthy robust man.

On testing for sensation, there was found a condition of anesthesia for all forms of sensation, existing up to the umbilicus. To the left of the umbilicus the transition between normal sensation and anesthesia was quite sharp—a zone not exceeding half an inch in width. To the right of the umbilicus this zone was much wider, measuring two inches in width. In this zone the patient was uncertain as to the sensation, sometimes feeling plainly the prick of the esthesiometer; at other times not. This zone extended around the body to the spinal column on the right. Sensation above the umbilicus was normal. The patient had also lost the sense of position in the legs, along with the temperature sense, tactile sense and sense of pain.

Motility.—There was present absolute loss of all movements in the thighs, legs and feet, besides loss of compression of the lower abdominal muscles. All movements above the umbilical level were well executed. Patient was unable to turn in bed.

Reflexes.—Babinski's toe reflex was present to a marked degree in both feet. The plantar reflex was present on both sides. Ankle clonus very marked on both sides. Exaggerated patellar tendon reflexes were present on both sides. Patellar clonus was present on both sides. Cremasteric reflex was absent on both sides. Hypogastric reflex lost on both sides. Epigastric reflex was present on both sides. The deep and superficial reflexes were all present and normal above the umbilical level. The bladder had become parietic, sphincter control being lost. A degree of constipation existed, with some loss of sphincter control if the fecal masses crowded down on the sphincter muscle. Priapism did not exist and loss of sexual power was acknowledged.

An electrical examination of the leg muscles was not undertaken. The edema partially disappeared and showed no marked wasting or atrophy of the muscles of the lower extremities.

An examination of his condition on the following day, March 20, 1908, revealed identically the same condition, particular attention being directed toward the zone or level of anesthesia.

Reviewing the subjective condition, namely, history of debility, prostration, followed some months thereafter by pain

which could only be relieved by suitable or favorable posture, extending through a period of four months, with a gradually increasing weakness of the legs, difficulty in maintaining an erect stature, ataxia and finally a sudden loss of power; subjective feelings in the legs, with loss of sense of position, paresis of bladder, coupled with such objective signs as loss of motility, loss of sensation, exaggeration of deep reflexes, and the clinical picture assumes at once a condition due to compression of the spinal cord. The level of anesthesis corresponding to the umbilical zone, the paralysis of the lower abdominal muscles, while the upper abdominal muscles remained intact, the abolition of the hypogastric reflex while the epigastric reflex was obtainable, pointed to the tenth thoracic segment of the cord as the *niveau* diagnosis. The absence of cystitis and decubitus, and the general robust condition of the patient spoke for an operable diagnosis.

The patient was prepared for operation, and on March 28, 1908, a laminectomy was performed by Dr. Roswell Park. The arches of the ninth, tenth, eleventh and twelfth thoracic vertebrae were removed, and on exposing the dura, an elongated friable tumor was found to the right and anterior of the cord. It was successfully removed, the wound completely sutured and the patient returned to his room.

Microscopical examination proved the tumor to be a round cell sarcoma.

The patient made a slow and rather unsatisfactory recovery from the operative procedure, and on leaving the hospital after four weeks was improved as regards subjective symptoms, but had not regained power over the legs or control of the sphincters. Nothing has been heard of the patient since leaving the hospital, his home being in the northeastern part of New York state.

CASE No. 3.—Elizabeth Y., female; age, forty-one; housewife.

Family History.—Mother died of diabetes; one uncle and one aunt died of consumption. Otherwise family history is negative as regards cancer and consumption. She passed through the usual diseases of childhood, had pneumonia when two years old; menstruated at fourteen, and is the mother of six living children.

Present Illness.—In August, 1907, the patient first noticed a painful stiffness in the right shoulder blade and between the shoulders, which would continue until after she had rested. These pains then extended to the right side of the chest, localized near the breast and axilla.

In January, 1908, she first experienced pain in the right elbow, which has continued to the present time; this pain she describes as a burning ache. Toward the end of February, 1908, a pain of the same character and constancy appeared in the left elbow. On February 29, 1908, Dr. Richter was called to see her, and "found her in bed, pale emaciated, tongue coated, pulse 90, weak and thready, temperature 98.5. The result of the physical examination was negative."

About March first, she noticed a sharp pain in the left knee, which lasted a few hours, then disappeared. On the same day she began to feel unsteady in walking, her knees would give way and she would have to catch herself. A numbness of the left leg appeared simultaneously with the weakness, and extended up toward the hip, accompanied by a tingling, prickling sensation, which has persisted until now. On March 14 pain began to be felt in the right knee, which was somewhat less severe than the pain in the left knee, and of shorter duration. This was accompanied by a prickling sensation in the right foot and a numbness which extended gradually to the right hip. These prickling sensations lasted a few days, during which time she was able to limp about and after a week's time the numbness had reached the hips and she was unable to walk.

On March 15, 1908, I was called to see the patient in consultation with Dr. Richter. She was in bed suffering greatly with the pain about the elbow joints, back and chest. There was impaired motion of the arms and legs, but not to any marked degree. The patellar tendon reflexes were exaggerated, ankle clonus was present on both sides, likewise a positive Babinski, and the muscle and tendon reflexes of the arms were markedly exaggerated. Bladder and rectal reflexes were not particularly involved. Sensation was not materially disturbed. The examination in her house was not very satisfactory—a small bedroom, no light and no accommodations made accuracy almost impossible. She was strongly urged to enter the Buffalo General Hospital where she could be better cared for and repeatedly examined. The diagnosis was strongly in favor of a tumor located in the lower cervical segment of the cord. Dr. Richter reports that until March 21 her condition was "unimproved." On March 22 she complained of a sense of weight in both lower limbs. On March 23 anesthesia for all tests was present in both lower limbs with very nearly complete motor paralysis. On March 24 motor paralysis was complete in both lower limbs, and incontinence of urine and feces was present. Also anesthesia to all tests had extended to the lower margin of the ribs. Patient, who had heretofore refused, now consented to go to the hospital where she was sent on March 24, 1908.

On examination at the hospital the patient was found to be in a decidedly worse condition than when examined two weeks previously. In only one respect was there any apparent improvement, and that was the cessation of pain about the shoulder blades and between the shoulders. The pain about the chest had also disappeared, and the only pain experienced now is the localized pain about the elbows which is not severe and quite bearable.

On examining her body, a bed sore is found about the size of the palm of the hand; this broke through during the night. The muscles are soft and flabby and voluntary motion is lost com-

pletely in both legs. The grasp of the hands is weakened, the ulnar region being most affected. Abdominal breathing is very marked, and on observing the thorax, it is found that no thoracic respiration is taking place. Several blisters are observed about the body; one about the size of a five cent piece is situated under the right nipple; a larger one is seen on the axillary line above the crest of the ilium; another on the right thigh about the size of a quarter dollar. The left pupil is more contracted than the right. Both react sluggishly to light.

Reflexes.—The patellar tendon reflexes are now abolished; ankle clonus not obtainable; no Achilles tendon reflex and Babinski is absent. In the arm the triceps and biceps tendon reflexes and the muscle reflexes are exaggerated. The epigastric and hypogastric reflexes are not obtainable.

Sensation.—There is absolute loss of all forms of sensation from the toes to the border of the third rib ventrally, and on the arms the inner sides are anesthetic. There is suppression of urine and obstinate constipation, necessitating catheterization. There are found several hard distinct glandular swellings in the left supraclavicular space.

She is put upon a thorough tonic treatment to fortify her for an operation, which the family is loath to consent to.

The diagnosis of a tumor involving the lower cervical and first thoracic segment is definitely made, but some doubt is expressed as to the wisdom of an operation, as in all probability the tumor—a probable carcinoma—has thoroughly infiltrated or strangled the spinal cord, as evidenced by the complete change in the tendon reflexes. The breathing is becoming more laborious, the patient coughs very feebly and is unable to raise any mucus. Dyspnea is quite frequent and abdominal breathing is absolute.

On April 2, 1908, a lumbar puncture was performed by Dr. E. R. McGuire, and 10 c.c. of a clear, amber-colored fluid were withdrawn. This operation was painless and patient did not know it was over until shown the abstracted fluid, which on examination was negative. The patient and friends were now very eager to have an operation, and on April 3, 1908, she was taken to the anesthetic room and prepared for operation. After this simple exertion her pulse was found so weak and thready that a blood pressure test was ordered made, which registered but 65 c.c. of mercury. Fearing that she would not survive even the anesthetic she was returned to the ward, and her last chance for relief was gone.

From this time she lost rapidly in strength, her cough became more persistent, moist rales were everywhere present throughout the lungs; the bedsores increased rapidly in size and depth, and on April 12, she suddenly expired.

The report of the autopsy follows: Mrs. Elizabeth Y., age 41, American. Diagnosis spinal cord tumor. Admitted to Buf-

falo General Hospital March 25, 1908. Died April 12, 1908, 4:25 P. M. Nutrition, emaciated; rigor mortis, not set in.

Spinal Cord.—Opposite first dorsal spine a bluish discoloration showing through the dura mater. Directly in front the seventh cervical spine a cauliflower-like mass was found, lying on the right side of the cord. It was about the size of half a

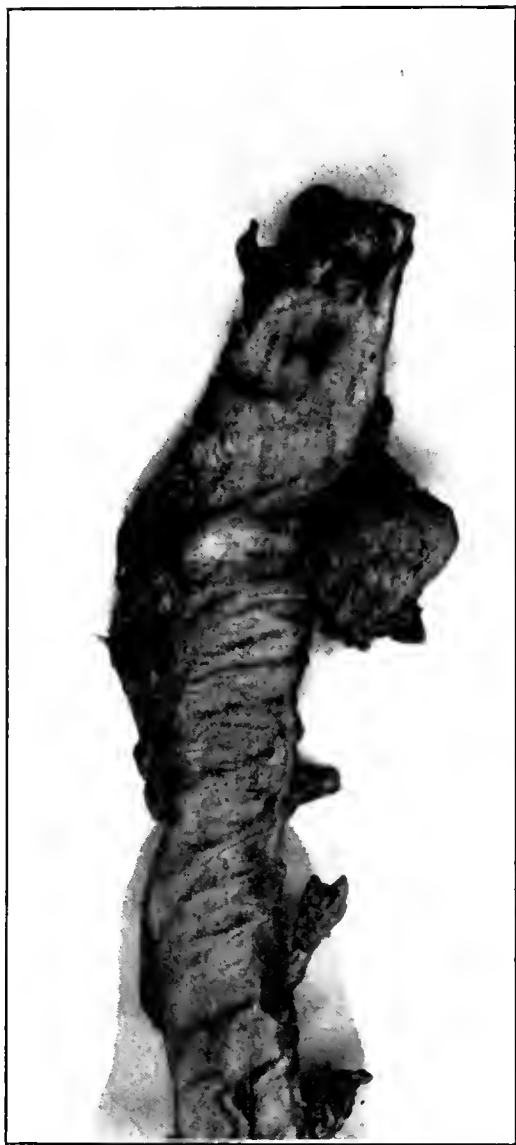


FIG. 1. Photograph of cord with tumor attached. Posterior or dorsal aspect.

walnut, causing erosion of body and pedicles of seventh cervical vertebra and first dorsal vertebra. Posteriorly, tumor mass extends upward about one and one half inches. A little erosion of bone over the body of sixth cervical vertebra is found. Cord removed from the third cervical to the sixth dorsal vertebra and not opened.

An examination of the tumor made at the Gratwick Laboratory showed it to be a typical carcinoma.

A phenomenon was observed by the writer during the course of these operations which may be of some service in locating the situation of the tumor after the dura has been exposed, provided the tumor is intradural, or intramedullary. The increased



FIG. 2. Anterior or ventral aspect of tumor. Natural size.

bulk of the cord produced by an intradural or intramedullary tumor will completely occlude the lumen of the dura and interrupt the passage or flow of the cerebro-spinal fluid. There will result a damming back of the cerebro-spinal fluid cephalad of the constriction and an increased tension will follow. Caudad of the constriction (tumor) the cerebro-spinal fluid will be diminished in tension, owing to the cutting off of the normal tension and

circulation. Incising the dura cephalad of the tumor will cause a spurting of the cerebro-spinal fluid, a jet being projected from several inches to a foot or more in height, according to the tension or force of the fluid; while caudad of the tumor, an incision into the dura, will cause only a welling out of the fluid from the aperture, flooding the field of the operation without any force or tension. Observing the behavior of the fluid, the surgeon will know whether he is cephalad to the tumor or caudad to it, and can make his incision accordingly.

This phenomenon has been observed several times at the Buffalo General Hospital, and it is believed that it has some significance and value in detecting the situation of intradural tumors after exposure of the dura.

HENOCH'S PURPURA WITH SPINAL CORD SYMPTOMS

GOLDWIN W. HOWLAND, M.B., M.R.C.P.

The interest in this case lies in the combination of two rare diseases and the possible relationship between them.

This little girl was born in England, her parents are dead; one from pneumonia, the other from gastric carcinoma. During her school life she suffered from a feeling of malaise, and felt heavy and dull, frequently going to sleep in school hours.

At the age of twelve she had an attack of hematemesis, which was followed by the appearance of hemorrhagic spots in the skin, swelling of the joints, eyelids, and blood in the stools, with diarrhea. This lasted fifteen weeks, and after convalescence a return of the trouble occurred, lasting five weeks.

The only result following these attacks was the presence of pain at the back and top of the head.

For one year she was free from illness, but still had frequent headaches and felt lethargic.

At fourteen she entered an institution and shortly afterwards a third attack of purpura occurred, leaving her with a disabled right elbow. During this year she also had her first attack of *chorea*.

On July 15 she came to Canada and attempted to earn her living, but cut her right hand, which was followed by swelling and formation of lumps up the forearm(?). Soon after this her right elbow became sore again and prevented her working, and she began to let things in her hands drop. The right hand has felt colder than the left in cold weather.

May 31, 1908. At present the girl shows the following signs: Aged 16. Slightly built, no evidence of any disturbance of facial muscles. Cranial nerves are normal. - Quite definite lateral curvature of the spine, with associated dropping of left shoulder.

The sensory signs only affect the right side of the body.

Pain to prick and deep pain are lost from a line from the tenth dorsal vertebra to the midline in front, below and reaching above, up to the inferior maxilla in front, but behind covering the scalp and reaching above to the supra-orbital edge.

Over the entire outer portion of the arm the sensation to pain is present, reaching the half of the third finger below.

Sensations to cold and heat apparently follow the same area on the arm, but on the body the lower edge corresponds with the eighth and ninth dorsal vertebræ.

The sense of position is lost in the two inner fingers.

Deep touch and deep pain correspond to touch and pain respectively.

Lastly, over the affected elbow joint there is an area of hyperesthesia both to deep and superficial pain.

The motive power of the left arm is normal, but the right arm is definitely weaker than the left, especially at the *wrist* and *elbow*.

The electrical reactions of the muscles of the right arm are diminished, but faradic and galvanic response are both present.

The right elbow joint is hyperextended but shows no thickening or rigidity, there is decided hypotonicity of the muscles around the joint, and to all appearance the same hypotonic condition is present in wrist joint and slightly also in the shoulder.

The cause of the pain in the elbow joint appears to be perhaps due to the overextension that is constantly present.

The condition is similar to the hypotonicity in locomotor ataxia.

The reflexes are equal and normal at the elbow, knee and ankle. Plantar reflex is flexor.

The question that arises is—*Is this* a case of *purpura* in which spinal cord hemorrhages are present, and is the joint condition due to the local joint hemorrhage or to the spinal hemorrhage; or is the case one of syringomyelia accompanied by its quota of sensory signs and *joint conditions*; and what relation is there between the syringomyelia and the purpura?

ANKLE CLONUS IN A CASE OF MAJOR HYSTERIA

BY JAMES D. HEARD, M.D.

AND

THEODORE DILLER, M.D.

PITTSBURGH

The question as to whether ankle clonus may occur as an expression of hysteria, or not, is interesting and practical, and one which appears to be in much dispute today. Without attempting to review the literature of the subject we desire to offer, for what the evidence may be worth, the following clinical record as a contribution to the study of this subject.

A young woman, aged 19, was admitted to the Pittsburgh Hospital on February 24, 1909, in a state of convulsions. She remained in the hospital until May 20, when she was discharged. From the date of her admission, February 24, until April 13, she had several convulsive seizures lasting from fifteen minutes to two hours. In these convulsions the patient appeared to be in a state of semi-consciousness. She stated she could remember some things that happened during the convulsion, but for most of the events her mind was blank. These convulsions were alike in character, differing only in duration, severity, etc. During a seizure she kicked, squirmed and wriggled; frequently her back was arched and her head and heels alone rested on the bed. She did not bite her tongue or froth at the mouth. The seizures were not suggestive of epileptic convulsions.

On admission she complained of great tenderness along the entire spine and of frontal and occipital headaches, and she suffered from an almost complete paralysis of the left arm.

The patient's present illness began five years ago, when she had a fall, striking her head on a stone. She was unconscious at this time for a period of two hours. Since this accident she has been subject to tenderness over the spine and to attacks of weakness and trembling and semi-consciousness, lasting from one to two hours. During these attacks she has never frothed at the mouth nor bitten her tongue, nor has she injured herself by falling.

Not much could be learned as to the patient's previous history. She stated that she had never had any serious illness; but it was learned that she had been a neurotic person and subject to frequent attacks of somnambulism. No history of infectious disease

of any kind could be obtained. A sister is also subject to attacks of somnambulism.

The patient was examined on several occasions by Dr. Emmerling and ourselves. She was fretful, irritable, peevish and fault-finding, so that she was hard to get on with. The lightest touch or pressure anywhere along the spine produced exaggerated expressions of pain. Just below the breast, on the left side, there was an area of great tenderness about the size of the palm of the hand. There was no loss of pain or contact sense; the conjunctival reflex was present; and the fields of vision were normal. On the motor side the left arm was apparently almost completely paralyzed.

The urine and blood were examined repeatedly with practically negative findings. The urine, however, varied in specific gravity from 1,008 to 1,034. The patient's case was recorded by Drs. Heard and Emmerling, who first examined her, as one of major hysteria and she was placed upon appropriate treatment, including isolation, moral control, baths, etc.

On April 23, she was examined by Dr. Diller. At this time she had considerably improved. Her convulsions were becoming less and less frequent and less severe, and the patient's whole mental attitude seemed to have grown more reasonable. She made less of her various complaints. However, the symptoms above enumerated, in a milder degree, were still present.

On examination the knee-jerks were excessively exaggerated. A slight tap on either patellar tendon produced excessive reaction. The Achilles jerks were also greatly exaggerated. Ankle clonus was present on both sides, more marked on the right than on the left. On the right side the clonus was kept up for more than a minute and even then did not subside spontaneously. On the left side it would last for perhaps half a minute. The test was made in the ordinary way, by placing one hand in the popliteal space and slightly flexing and supporting the knee; and then with the other hand on the ball of the foot suddenly and forcibly extending the foot upward. These tests were repeated two or three times and always with the same results.

The patient was carefully examined several times for physical disease, but none could be found. The heart, lungs and abdominal organs appeared normal.

When the patient was examined by us two weeks later it was found she had greatly improved. She had had no convulsions during this period. The knee-jerks were now only moderately exaggerated; and by repeated tests not the slightest clonus could be elicited.

Two weeks after this (May 19) the patient was again examined. The spinal tenderness had almost entirely disappeared and the tenderness below the left breast was very faint, and the patient's mental condition had immensely improved. She

was quiet and composed in her manner and looking forward with pleasant anticipation to leaving the hospital the next day.

Comment.—The diagnosis of hysteria rested on the character of the convulsive seizures; the spinal and sub-mammary tenderness; the mental condition of the patient; the paralysis of the left arm; together with the rapid improvement of all these symptoms under treatment appropriate for major hysteria. This improvement was coincident with the enforcement of a treatment which was instituted a little before Dr. Diller first saw the patient, consisting of strict isolation (screen drawn about the bed) and systematic and studied neglect of the patient. (The physician visited her only two or three times a week.) We are convinced that the rapid improvement was due to this method of treatment which is mentioned here only as having a bearing on the question as to whether this was a case of hysteria. The absence of organic disease after careful search is of importance from the negative point of view.

And now as to the ankle clonus, when this patient was examined on April 23 the evidence as above indicated strongly pointed to the diagnosis of hysteria. One feature, and one only, would have seemed to contradict this diagnosis or to have pointed to the view that the case was one in which there was organic disease in addition to the hysteria or lying back of it. We refer to the old dictum that ankle clonus is always indicative of organic disease. Despite the presence of ankle clonus we regarded the case as one of hysteria, and looked upon the ankle clonus as an expression of an hysterical state; and this view we believe is borne out by the complete disappearance of the ankle clonus two weeks later, during which period the patient had in every way greatly improved, and by the complete recovery of the patient under a strict anti-hysterical treatment.

We have several times seen cases in which the symptoms seemed to point to hysteria; and the presence of ankle clonus alone appeared to contradict this view. But in the case that we have just related, the evidence appears to our minds as convincing that ankle clonus is not necessarily indicative of organic disease, or in other words that it may be present as an expression of hysteria.

Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

November 9, 1909

The President, DR. J. RAMSAY HUNT, in the Chair

TIC DOULOUREUX OF THE SENSORY FILAMENTS OF THE GENICULATE GANGLION: OPERATION: RECOVERY

By Dr. L. Pierce Clark, M.D.

This case was one that had already been mentioned by Dr. M. Allen Starr in the discussion of Dr. Hunt's paper before the American Neurological Association in 1908, and the patient was shown by Dr. Clark before the American Neurological Association, June, 1909, five weeks after operation, as a cured case of this peculiar form of geniculate otalgia.

The patient was a young woman whose neuralgic pain in the ear was rather sharply limited to the anterior wall of the external meatus and a small portion of the skin just in front of the ear, the essential supply zone of the geniculate to the ear and face, as described by Hunt. He advised the removal of the geniculate ganglion, but Dr. Alfred S. Taylor, to whom the case was referred for operation, thought it would be best to cut the pars intermedia of Wrisberg, and thus effect a so-called physiological extirpation of the geniculate ganglion, as Frazier and Keen had so successfully done on the sensory portion of the trigeminal nerve by resection of the sensory root dorsad to the Gasserian ganglion. When the patient was shown at the meeting of the American Neurological Association last June she had a slight degree of cerebellar ataxia resulting from the operation, and a complete left facial palsy. At the present time, five months after the operation, there was complete absence of cerebellar symptoms, continued freedom from otalgic pain, and the decided beginning of recovery from the facial palsy. The patient now seemed in a fair way to more or less complete recovery from her otalgia and the subsequent operative palsy.

Dr. Alfred S. Taylor, in describing the technique of the operation, said that an osteoplastic flap was turned down back of the left ear, and then a dural flap was made with its base towards the median line and well forwards toward the mastoid process. The cerebellum was retracted towards the median line. The seventh, eighth, ninth, tenth and eleventh nerves were then exposed and identified, and since it was necessary to eliminate the pain, it was deemed justifiable to divide all of the nerves running into the internal auditory meatus: however, only the seventh nerve, the pars intermedia and the upper fasciculus of the eighth were divided. The wound was closed without drainage. The patient was told at the time that the resulting facial palsy would probably only be

temporary, and the returning power of the muscles at the present time would probably establish the truth of that prognosis.

Dr. M. Allen Starr, who saw this patient in December, 1907, and reported the case in the discussion of Dr. Hunt's paper before the last meeting of the American Neurological Association, said that he had recommended an operation and had sent her to Johns Hopkins Hospital for that purpose seven months before Dr. Taylor had operated on her.

Dr. William M. Leszynsky, who had also seen the patient, said he had recognized the condition as an unusual type of neuralgia. It did not correspond to any form of trigeminal neuralgia that he had ever before seen. Drs. Clark and Taylor were certainly to be congratulated upon the brilliant result. The facial paralysis, which seemed to be disappearing, was unimportant, when we consider the complete relief from extreme pain.

Dr. J. Ramsay Hunt congratulated Dr. Clark and Dr. Taylor on the brilliant result achieved in their case of section of the sensory root of the seventh nerve for intractable otalgia.

Dr. Hunt referred to his preliminary reports on the subject of otalgia and its relations to the sensory system of the facial nerve,¹ and to his address before this society in February of the present year, in which attention was again directed to the "neuralgic affections of the facial nerve" and the advisability of surgical intervention in intractable cases was pointed out, along the same lines as had been found useful in the treatment of tic douloureux of the face. So that the case presented not only confirms his views regarding the symptomatology of the sensory facial, but is a most important contribution to practical otology.

Dr. Starr asked Dr. Hunt if he had ever seen or heard of a case in which the lancinating pains, corresponding with trigeminal neuralgia, were confined to this distribution of the facial nerve.

Dr. Hunt replied that cases of this severe type are quite rare, but a small number are to be found recorded in literature. Personally he had never observed a case of such severity.

Dr. Clark, in closing the discussion, said that in looking up the literature of the subject he had found that one of the writers upon the subject dwelt especially upon the character of the pain in these cases. In one case recorded the pain was so violent in character and came on with such sudden intensity that it threw the patient out of bed. The speaker said that in the case they had shown he thought the outlook for a complete return of power in the facial muscles was very favorable.

Dr. Max Mailhouse made some observations on an isolated case of family periodic paralysis.

Dr. Clark asked Dr. Mailhouse how the boy's food was cooked. He stated that in the last edition of Schmidt's book on the feces he mentioned that unless the meat was thoroughly cooked, the fibrous tissue would pass through the stomach without digestion.

Dr. Mailhouse replied that he could not say how the food was cooked. The boy was a member of a Jewish family in ordinary circumstances and took his food with the rest of the family. The probabilities were that there was something in his economy that prevented him from properly disposing of the fibrous elements of his food.

¹ JOUR. OF NERV. AND MENT. DIS., Feb., 1907. Archives of Otology, 1907.

THE DIAGNOSIS AND TREATMENT OF TUMORS OF AND ABOUT THE SPINAL CORD, WITH REPORT OF SIX OPERATED CASES

By Pearce Bailey, M.D.

The author stated that while an analysis of the recently published results of operations for tumors of and about the spinal cord were brilliant, considering that the operation was barely twenty years old, one could not but feel that it fell short of its possibilities, and that neither the neurologist nor the surgeon had as yet extracted from it all it had to give. Patients had died from excessive loss of cerebrospinal fluid, from sepsis, from shock and from exhaustion. The errors had been only partly surgical, for the patients had been rendered more liable to succumb to them through diminished resistance caused by delay in operating. In a large number of the recorded cases the symptoms had preceded operation by two or three years or more, and pending the trial of futile treatments, notably the mercurial, the chances of cure had been lessened. Errors in diagnosis, unavoidable during the formation of a complete symptomatology of this rare disease, had also helped to swell the list of failures. Cases had been overlooked, either entirely or until beyond help, operations had been waived aside because certain symptoms or the lack of them seemed to undermine all basis for interference. The speaker said he had seen more than one operation given up on the ground that the tumor was intramedullary, a diagnosis practically impossible; or because pain (which might be entirely absent) was not pronounced enough to make the diagnosis sure. Until now, perhaps, conservatism had not been misplaced, but the time had surely come to widen the operative horizon. We were now in possession of new clinical guides, notably serous meningitis as a complication or a disease, the occurrence of internal hydrocephalus with its choked discs and cranial nerve palsies, the fact that tumors exerted their chief pressure at the upper pole, and that faint anesthesia might be of equal practical value as total anesthesia. We had also learned how erratic tumors in and about the spinal cord might be, in that their course might be rapid or slow, cardinal symptoms might be lacking, and the whole clinical picture might resemble some totally different condition.

In the past, diagnostic efforts had been directed chiefly to the determination of the variety of tumor and of its position with reference to transverse section of the cord, but now it had been forced upon us that a spinal cord tumor might masquerade under the guise of any one of many chronic spinal diseases. The question used to be, "Were we sure an operable tumor was present?" It now was, in every case of paraplegia coming on without known cause, "Were we sure a tumor was not present?" So we were destined, henceforth, to operate more freely on the spine. Failures would be encountered, but the successes would more than counterbalance them.

Dr. Bailey then reported in detail six cases of tumor of the spinal cord which had come under his observation and in which an operation had been done. In discussing the symptomatology, he stated that since his report in 1892 of a patient who died from spinal cord tumor without having suffered severe pain, a considerable number of cases had been recorded in which pain was inconspicuous or altogether absent. This

remarkable variation from the usual injected new difficulties into the diagnosis. When pain was present, as it was in over 90 per cent. of cases, fifth nerve neuralgia and the pains of labor were its only rivals in severity. Some loss of sensibility in the skin was a regular symptom, and was second to pain in the order of development. By the time that pain had acted in a way to arouse the suspicion of spinal cord tumor, some anesthesia was usually demonstrable. It might at first be a root symptom, found in the same areas as were the seats of the pain. Like pain, the anesthesia might recede from day to day or from week to week, but, unlike pain, once established it rarely disappeared entirely. Extreme fluctuations in the degree of anesthesia should excite the suspicion of multiple sclerosis, and a rapid climbing upward of the superior anesthetic limit spoke in favor of intramedullary tumor. Interference with tactile sensibility was the commonest variety of anesthesia and the most reliable for purposes of localization.

The one significant vasomotor symptom which had not received much attention was edema. This had been observed chiefly in the lower extremities, in tumors of the lower segments of the cord and in cauda lesions. It had the general characteristics of edema due to kidney disease, but was distinguished from it by the urine being normal. In a constantly increasing number of cases, tumors in the upper part of the spinal axis had been associated with choked disc and symptoms referable to the mid-brain and cortex. Such cases were explained on the assumption of an internal hydrocephalus.

In discussing the technique of the operation for the removal of spinal tumor, Dr. Bailey said the prevention of the escape of cerebrospinal fluid seemed to him very important. Until recently, no particular attention had been paid to this at operation, but the question arose if some of the sudden deaths following these operations might not have been partly attributable to this cause. At any rate, the avoidance of this danger, if it be one, was so easy that the recommendation should be widely known, and all these patients should be operated on in the Trendelenburg position, or at least on a table tilted head downwards. The leaking of cerebrospinal fluid after the operation, which had been the assigned cause of meningitis in certain cases, was easily avoided by careful suturing. Once the dura was opened and the tumor shown, the responsibility of the remainder of the operation was entirely with the surgeon. Few operations offered greater opportunity for the surgeon to show his handicraft. All cases should be left for those known to have both strength and delicacy of touch, accuracy and speed.

Dr. Robert Abbe said he thought it most important to recognize the fact that operations on the spine could be done with very little risk from hemorrhage. In order to avoid the danger of excessive bleeding, it was formerly advocated that a small saw be used upon the laminae. Practically, hemorrhage by his method of operating is insignificant. Using a fine saw is more apt to cause bleeding than cutting out the laminae by rongeurs. Dr. Abbe said that in doing these operations, after trying several methods, he had adopted the plan of incising the skin and muscles vertically alongside the spinous processes on the side where it was intended to expose the cord. The muscles not being firmly attached to the laminae, it is easy to dissect them back with the blunt-ended scissors, and hold them there with retractors. This gives rise to very little hemorrhage. He then nips off as many of the tips of the spinous processes as deemed

necessary, leaving the ligament connecting them, and separates the muscle from the other side of the laminae, thus giving a clean exposure of the laminae. With the cutting rongeur the cord is then exposed. The hemorrhage is always insignificant and can be checked with a little pressure. The parts are then bathed, the dura split, and the tumor, if found, removed. Dr. Abbe said the fact that no tumor could be felt through the dura was no evidence that none was there. He recalled one case where a tumor of the cord, that gave rise to grave symptoms, could not be palpated through the cord. In the fatal case which had been referred to by Dr. Bailey the hemorrhage had been insignificant and only a comparatively small amount of cerebrospinal fluid had escaped. The tumor was easily removed, and the wound was closed. Notwithstanding the favorable outlook of the case, the patient went into a condition of profound shock, and died thirty hours after the operation. There were no signs of suppuration nor meningitis, and the bacteriological examination was negative. The only explanation that could be given for the unfavorable outcome of the case was the loss of the cerebrospinal fluid. The operation for tumor of the spinal cord, Dr. Abbe said, could be done under local anesthesia, either novocain alone or with the addition of a little adrenalin, and he had several times operated for fracture of the spine by that method. The only pain lay in the nerves, muscles and skin, and was easily dulled with a local anesthetic; the work on the bones was not painful. The dura and nerve roots could also be handled under a local anesthetic. The speaker said that spinal metastases from giant-celled sarcomata must be comparatively rare; personally he had never seen such a case.

Dr. Joseph Collins reported in detail three cases of spinal cord tumors that had recently been operated on for him by Drs. Abbe and Erdmann. In one of these cases, which had already been referred to by Dr. Abbe, the patient belonged to that category of cases described by Dr. Bailey in which the diagnosis has been considered, until recently, more or less guess-work, and it illustrated what he said of the necessity of having more than a suspicion of the existence of spinal cord tumor when paraplegia is associated with indefinite sensory symptoms. In the case that Dr. Abbe operated there, the operation was completed very rapidly, without excessive hemorrhage or great loss of cerebrospinal fluid, yet the patient died thirty hours later in a condition of profound syncope which was due, apparently, to an inhibition of the automatic centers of the medulla. Her symptoms tallied closely to those of three other remarkable cases observed at his clinic after the removal of cerebrospinal fluid. Hereafter, Dr. Collins said, he would request that during operations on the cord the patients should be placed in such a position that the cerebrospinal fluid could not escape, and he saw no reason why the operation should not be done with the head low.

Dr. Collins then gave a detailed description of three cases of spinal cord tumors operated during the past year and said that while the results in these three cases of operation for spinal cord tumor had not been very brilliant, he appreciated the fact that the field of spinal surgery was a much more graceful one than the brain. Nothing had impressed him more than Dr. Bailey's method of reaching a diagnosis in these cases. It was based largely upon the presence of objective sensory symptoms, which in the ordinary experience were usually overlooked, and in appreciating the importance of hypesthesia really more than profound anesthesia.

Dr. Joseph Fraenkel said that while this subject had been covered so thoroughly in Dr. Bailey's paper and by those who had discussed it, there were still some points that awaited final solution. He agreed with what had been said about the value of hypesthesia in contradistinction to well-marked anesthesia. In one case of carcinomatous metastases on the cord that came under his observation, he had based his diagnosis in the earliest stages largely upon the presence of well-marked hypesthesias. Dr. Fraenkel said he did not agree with Dr. Bailey that one is justified in recommending operation whether the tumor was intra- or extra-spinal. Such might prove to be the case in the future, but at present we should still try to differentiate between the intra- and extra-medullary growths, and furthermore, between the growths on the anterior or posterior aspect of the cord. Among the sensory phenomena that frequently led to diagnostic errors were what he would call distant sensory symptoms. The extra-medullary growths, particularly those located anteriorly, would be the more likely to give such distant sensory irritative symptoms.

Dr. George Woolsey said that in regard to the surgical treatment of tumors of the spinal cord, it had always seemed to him that the simplest technique was the best. That which he had followed differed only from that of Dr. Abbe in the approach to the laminae. He could never see any object in retaining the spinous processes of the vertebrae; they did not add to the strength or protection of the cord, and in fact, the rough ends of the divided spines might press seriously on the dura. The hemorrhage accompanying these operations was not serious in his experience. After removing the laminae with the rongeur forceps and opening the dura it was not always at first perfectly clear whether we had to deal with a tumor or not, and if one was present, its exact limitations were sometimes obscured by the thickened laminae of the arachnoid, which often form the wall of a cyst surrounding the tumor. The operation was reasonably safe, and the speaker thought we were justified in urging it in every suitable case. Some years ago, Dr. Harte, of Philadelphia, collected a series of 92 cases from the literature in which the mortality was nearly 47 per cent. Krause gave the mortality as 43.7 per cent., and in the last 12 cases it was 25 per cent. The late Dr. McCosh said that laminectomy should not give a mortality of more than 10 per cent. Personally, Dr. Woolsey said he had operated seven times on cases of intraspinal tumor with a single death, a mortality of 14.3 per cent. Including three exploratory operations the mortality was just 10 per cent. The dangers of the operation are shock, infection and perhaps the free escape of cerebrospinal fluid. Shock is largely due to hemorrhage and a prolonged operation. Excessive hemorrhage should be carefully and readily guarded against, as well as the free escape of cerebrospinal fluid, and the operation should not be unduly prolonged. The loss of cerebrospinal fluid could be largely obviated by placing the patient in the proper posture. In the first case in his series a little gauze was lightly packed between the cord and the dura to check the outflow of fluid, but this had not been found necessary in subsequent cases. According to Heule the free outflow of cerebrospinal fluid has repeatedly been followed by a fatal termination, even without infection, but the only bad effect that the speaker had observed that might be attributed to this outflow was restlessness and delirium. The development of sepsis and meningitis, which had perhaps caused more deaths than anything else, could be guarded against by careful asepsis aided by the administra-

tion of urotropin before and after the operation, as it had been demonstrated by Dr. Crowe, of the Johns Hopkins Hospital, that this drug was excreted by the cerebrospinal fluid. In speaking of the prognosis of these cases after operation, Dr. Woolsey said that in his experience it had usually been favorable. Although these growths are, as a rule, pathologically classed as fibro-sarcoma or endothelioma, they seemed to be comparatively non-malignant. In only one of the six cases was a recurrence known to have occurred and in that case after a second operation, a year later. Four years have now elapsed without recurrence, and the patient is now "practically well." The functional recovery is often slow, and some spasticity often remains in the parts first affected with paralysis, on account of the injury to the pyramidal tracts.

Dr. Charles A. Elsberg said he thought we must distinguish between an operation in which the spinal canal is merely opened and one in which more or less extended manipulations in the spinal canal are necessary. There was quite a difference in the dangers attending an operation in which the canal was merely opened, such as for spina bifida, and one that necessitated extended manipulations in the canal for the removal of a tumor. He said that in his operations for the removal of tumors of the spinal cord, he had removed the spinous processes entirely, and had found this procedure perfectly satisfactory. The danger of hemorrhage was comparatively slight, but that of the escape of cerebrospinal fluid was very great. He recalled one case of spina bifida in which the opening of the canal was followed by a free discharge of cerebrospinal fluid, and the patient immediately showed respiratory symptoms such as Dr. Cushing had described as being due to the forcing of the cerebellum downward into the spinal canal. Since then, the speaker said, he had always kept his patients in an inverted position. He was also in favor of the almost continuous irrigation with salt solution, the object of which was to prevent drying and also to keep a certain amount of fluid around the cord.

Discussing the technique of the operation, Dr. Elsberg said he was in favor of a large opening into the canal, necessitating the removal of four to six spinous processes and laminae, as it was very difficult to palpate the dura through a small aperture. He also emphasized the importance of exact closure of the dura and the tissues covering it, to prevent cerebrospinal leakage. Attention to this detail would go far towards preventing subsequent infection, with or without the use of urotropin before and after the operation. In fact, so thoroughly was the speaker impressed with its importance that in his operations on the spinal canal during the past two years he had used Cargile membrane to seal the wounds in addition to suturing them.

Dr. Charles L. Dana said he had had perhaps ten or eleven cases of spinal tumor operated on, and in only one instance was the operation followed by death. In four or five cases, where the spinal cord was exposed for exploratory reasons, the operation was perfectly harmless, and he was strongly in favor of an exploratory operation even in cases where there was nothing more than a strong suspicion of spinal tumor. In that peculiar and baffling class of cases to which Dr. Collins referred, in which there was progressive paraplegia, he had had the cord exposed in a number of instances with the hope that there might be a tumor, but he had never found any. The speaker recalled one case of supposed multiple sclerosis. The patient was afterwards seen by Oppenheim in Berlin, who also made that diagnosis. Finally, he saw Sir Victor Horsley.

who diagnosed a cyst of the cord and had an operation done, which did not benefit the patient, although he had been told a cyst had been found. A cyst, Dr. Dana said, must be an extremely rare condition in spinal cord pathology, and when present it was probably often secondary to atrophy or some other pathological condition of the cord or membranes. In his experience with operations for tumors of the cord, the successful cases were those in which the tumor was located between the middle of the cervical and the middle of the dorsal region. He had never seen any good result from operations upon the lower section of the spinal cord, for the reason, probably, that tumors in that location were so often of the malignant type and involved the bony structures. Even growths of the cauda equina were almost always associated with a bony process in his experience, and operations upon them had not been very successful. Of about thirty tumors of the spinal canal that had come under his observation, at least seven were carcinomatous and four or five osteo-sarcomatous—so that about one third of his cases had been of an inoperable character.

Dr. M. Allen Starr spoke of the relation of traumatism to the development of tumors of the spinal cord. Just as a certain number of tumors of the mammary gland appeared to originate after a slight trauma of the breast, so it was that tumors of the cord sometimes apparently developed after trauma. Some months ago, Dr. Starr said, he saw a young man at the Presbyterian Hospital who sustained a serious wrench of the neck in a football game. He complained of much pain with certain motions of the back and gradually developed a spastic paraplegia and some anesthesia. A partial dislocation of one of the vertebræ was suspected, and an x-ray picture showed a deflection of the line of the vertebræ. This was slight, and nothing more definite was found. There was no suspicion of tumor, but when he was operated on about a week ago by Dr. Blake, on the theory that he might have an organized clot or cyst pressing on the cord, an epithelioma two inches in length was found on the posterior surface of the cord, and outside of the dura there was a peculiar loose mass of connective tissue which indicated to the pathologist the organization of a blood clot from a hemorrhage that had probably occurred at the time of his injury. Whether this epithelioma had its inception at the time of the injury to the membrane of the cord was only conjectural.

Dr. Walter Timme said the case of carcinomatous metastasis of the cord in which Dr. Fraenkel had made the diagnosis was finally brought to autopsy, and showed not only a subdural tumor at the sixth dorsal level, but an extensive carcinomatous mass extending from the cervical to the lumbar region. At the sixth dorsal level there was an enlargement of this mass. This patient also had two large tumors of the brain, which had not been diagnosticated by any of the neurologists who had seen her. The specimens of both cord and brain had been presented before the Society in February, 1906, with a report of the case by Dr. Timme.

Dr. I. Strauss said that in one of the cases that had been referred to, which was afterwards operated on by Dr. Ware, there was, at the time of the operation, a gush of cerebrospinal fluid, and in that case there was probably a localized serous meningitis. In another case of paraplegia, which was diagnosed in the clinic of Dr. Collins as one of gliosis, the autopsy revealed a syphilitic meningitis with necrosis. This

patient had received a series of mercurial injections extending over a period of years.

Dr. Smith Ely Jelliffe mentioned having examined a patient with spinal cord tumor located anteriorly with the clinical picture of a beginning progressive muscular atrophy. This patient presented no sensory symptoms.

Dr. Bailey, in closing the discussion, said he was not in favor of the enormously long incisions that the surgeons had spoken of. Instead of removing five or six spinous processes, why were not three sufficient? He favored a small opening at first, through which the dura could be palpated, and which could be enlarged, if necessary.

NEW YORK NEUROLOGICAL SOCIETY

December 7, 1909

The President, DR. J. RAMSAY HUNT, in the Chair.

A CASE OF HYSTERICAL TREMOR OF THE HEAD

By J. Arthur Booth, M.D.

The patient was a man 28 years old whose past history was unimportant up to five years ago, when he had a severe attack of grippe. About a year later he complained of pain in the back of the neck which persisted for a week or ten days and was followed by a marked tremor of the head, with occasional involvement of the facial muscles. This tremor became so marked that it interfered with the patient's keeping a position. It was sometimes absent for a month or more, and then returned. For the past six months it had been quite persistent.

When Dr. Booth first saw the patient, two weeks ago, an examination failed to reveal any organic condition, either of the brain or spinal cord. He advised hydrotherapy, and under this treatment the tremor had decreased markedly, and it now came on only when the patient was lying down. Pressure on the back of the neck caused it to become coarser. It persisted when the eyes were closed, but ceased during sleep. There was no vertigo; no nystagmus. Under the influence of hypnotic suggestion, the movements of the head became slower and coarser.

Dr. L. Pierce Clark, who had seen the case at the Vanderbilt Clinic, said that while the patient was under his care considerable temporary relief had been obtained under the suggestive influence of galvanism and the static current. The patient was subsequently referred to a psychoanalyst, but was lost sight of. In his history the patient made the statement that he had always been of a nervous type. The diagnosis of hysteric polymorphic tic had been made.

A CASE OF ADIPOSIS DOLOROSA

By Dr. Booth

The patient was a widow of 60 who gave no facts of heredity that shed any light on her present condition. She had had a great deal of trouble and mental worry during the past ten years. In 1900 the uterus

and adnexa were removed for fibroids. Her present trouble began two years ago, when she noticed a marked increase in both lower extremities. This gradually progressed to such a degree that she had difficulty in walking. There was no edema of the legs, the enlargement apparently being due to huge masses of adipose tissue. In the past year, in addition to the enlargement of the legs, she had complained of paresthesia and lightning-like pains shooting down the legs, and even the contact of her clothing was painful. She complained that her feet were cold and lifeless, and gave her a sensation as though walking on the points of spears.

AN ANATOMICAL STUDY OF THE AMAUROTIC FAMILY IDIOCY

By Dr. Harlow Brooks, M.D.

The writer stated that amaurotic family idiocy was probably the first of this class of disorders to be studied by modern methods, and it was gratifying to note that very little had been added either to the clinical picture or to the pathological anatomy of the disease since the first paper of Sachs appeared.

The anatomical studies reported by Dr. Brooks in his paper were based upon three cases of amaurotic family idiocy occurring in the practice of Dr. Henry Wandless, who had already placed the cases on record from an ophthalmological standpoint. The three cases occurred in a family of seven children. The parents were both alive and well, and no ancestral history of apparent bearing could be elicited.

After describing these three cases in detail, including the autopsy findings, Dr. Brooks said that in addition to the changes reported in practically all cases of amaurotic family idiocy, he had found marked and more or less characteristic alterations in the thymus body and in the adrenal and pituitary glands. These lesions were of such nature as to strongly suggest long-standing atypical functional activity. With our certain knowledge of the dependency for proper growth and function of the central nervous tissues on the normal activity of these bodies, it seemed justifiable to assume a possible causal relationship in this condition. This was especially suggested by the well-authenticated relationship existing between the adrenal and neural activity and evolution, especially as demonstrated by the experiments of Brown-Séquard and of Tizzoni, and also by the probable rôle which disease (hypersecretion) of the pituitary played in acromegalia. On the other hand, it was quite possible that these lesions in the ductless glands were merely concomitant or associated ones; perhaps they were even secondary and dependent on ganglionic changes of a purely congenital nature. This did not, however, accord with our present-day ideas as to the rôle which these bodies and their secretions played in the animal economy.

Dr. B. Sachs said, strictly speaking, he did not think that the cases reported in Dr. Brooks's paper, and upon which his anatomical and pathological studies were based, belonged to the category of amaurotic family idiocy, as originally described by Sachs. They belonged to the juvenile type, and while the resemblance between this type and amaurotic family idiocy was very close, and while the two were doubtless more or less related, he would hesitate to accept the pathological findings and

the generalizations based upon them as proof of the fact that similar changes were present in amaurotic family idiocy. From both a pathological and clinical standpoint there were so many points of difference between these two types of cases that the speaker said he could not identify one with another. In the first place, there was a radical difference, not a single case of amaurotic family idiocy having ever been observed outside of the Hebrew race. Again, the course of the disease in these juvenile cases extended over a number of years, whereas amaurotic family idiocy terminated fatally in two, perhaps three years. The development of the symptoms in the two types was also different, and Dr. Sachs said that while he was willing to admit that there was a very close relationship between them, he thought it would be premature to accept the findings of Dr. Brooks as an explanation of the occurrence of the morbid conditions met with in amaurotic family idiocy.

In connection with this subject, the speaker exhibited a number of photomicrographs made by Drs. Fred S. Mandlebaum and I. Strauss, based upon a case of amaurotic family idiocy that recently came to autopsy. These corroborated the findings of Schaffer, and distinctly showed the disintegration of the cell body and the characteristic swelling of the dendrites. Schaffer, in his latest work on the subject, made the statement that he was willing to base the diagnosis of amaurotic family idiocy on this well-marked swelling of the dendrites. It was at least interesting, Dr. Sachs said, to establish this one fact, namely, that amaurotic family idiocy, representing, as it did, an extreme hereditary type, was a purely cellular disease. All the other changes that occurred were secondary and unimportant as compared with the cellular changes throughout the entire nervous system. In the case from which these photographs were taken the child was the fourth one in the family afflicted with this disease, and the case was a typical one in every respect.

Dr. Charles E. Atwood said that, as a matter of clinical interest, a colored idiot child that he examined at Dr. Starr's clinic recently showed changes in the eye corresponding to those observed in amaurotic family idiocy. His observations were subsequently corroborated by Dr. Ward A. Holden.

NOTE ON THE URETHROSCOPIC EXAMINATION OF NINETEEN TABETICS

By Charles Goodman, M.D., and Charles L. Dana, M.D.

Dr. Dana said he simply wished to record the observations made at his suggestion by Dr. Charles Goodman in nineteen cases of tabes in which urethroscopic examinations were made. The patients were at the Montifiori Home and were in the second and third stages of the disease. In two of these cases slight erosions of the membranous urethra were found; in four there was injection or congestion of the deep urethra, probably at least in part due to the instrumentation, and in the remaining cases the urethra was normal. All of these cases were in the second or third stage of tabes. He had had a good many patients of his own urethroscoped, but they were patients who had marked local bladder symptoms. No marked urethral lesions were reported, but naturally, relief of symptoms followed proper treatment. The facts presented showed that tabes dorsalis progressed irrespective of any urethral irritation.

Dr. M. Allen Starr said that subsequent to the claim coming from a certain source with regard to the importance of urethral lesions in the etiology of tabes, every case of that disease coming to the Vanderbilt Clinic between September, 1908, and the spring of 1909 was referred to the genito-urinary room and carefully examined for so-called ulcerations of the urethra. While he was not prepared to give the exact figures, his recollection was that about one fourth of the cases presented some lesion of the urethra, either an old stricture or some other condition of irritability of the tract, with more or less congestion of the mucous membrane, with or without discharge, and these lesions were uniformly treated without any great amelioration of the symptoms of the locomotor ataxia. In his private practice, Dr. Starr said, he had long been inclined to the view that an irritation starting from any part of the body, be it the urethra or rectum or stomach or throat or eye, could so increase the irritability of the nervous system as to make it more susceptible to the development and exaggeration of certain ataxic symptoms, particularly the pain. In September, October and November, 1908, he referred twelve cases of locomotor ataxia to Dr. L. Bolton Bangs and Dr. James R. Hayden for urethroscopic examination. In seven of these cases, distinct pathologic conditions were found in the urethra. One case seen by Dr. Hayden was particularly interesting. That patient for two years had lost control of his bladder and rectum. He was markedly ataxic in gait and suffered a great deal of pain. Dr. Hayden found a very extensive ulceration of the urethra, with marked stricture on the distal side of the lesion. With the relief of this urethral condition the patient regained full control of his bladder and rectum, which were the symptoms that had caused him most distress, and there was also a distinct improvement in his gait. The man returned to his home in St. Louis, and in a recent letter to Dr. Hayden he stated that he still had complete control of his bladder and rectum, that his gait was improved and that his pains were less severe. In two other cases in which similar conditions were found the relief of the local lesions had absolutely no effect upon the control of the urine and feces, so that it did not follow that because a tabetic had an ulceration of the urethra, that that ulceration was the cause of his incontinence. Of the cases sent to Dr. Bangs, two were quite a little improved by the local treatment and two were not improved at all, so far as control of the bladder and rectum and the occurrence of pains were concerned.

Dr. Starr said that while he had no faith that this local treatment of the urethra in tabes had had any great result, yet the fact that three out of twelve patients were somewhat improved by it made it incumbent upon us to keep the possibility of this condition in mind. While it could in no wise be regarded or indorsed as a cure of the disease itself, still the treatment and cure of these local lesions in the urethra, should any exist, might at times prove of value in the relief of incontinence of the urine and feces, and possibly in slight mitigation of pain.

Dr. William M. Leszynsky said he had had the urethra examined in four cases of tabes, and in every instance it was found to be absolutely normal.

Dr. I. Strauss said that in a case of tabes with retention that was referred to Dr. Goldberg at Mt. Sinai Hospital, the deep urethra was touched with a strong solution of nitrate of silver, with temporary restoration of power. In another case of retention that was assumed to be

tabetic, the retention was relieved for forty-eight hours by the same treatment. This was repeated successfully a number of times.

Dr. B. Sachs said there was no objection to the examination of the urethra of tabetic patients, and if any local lesion was found, it should receive attention. That was a very different thing from claiming that we might benefit these patients' general condition by the treatment of urethral lesions, and it by no means implied the necessity that every single case of locomotor ataxia should have local urethral treatment. The speaker said he had seen a number of cases who had received such treatment without resulting benefit, and the few cases that had been recorded in which improvement followed the treatment were probably outweighed by the absolute failures. It was well known that the bladder symptoms of locomotor ataxia were of a fluctuating character, and, like the lightning-like pains, might be improved either by what you do or what you did not do for the patient. On that account it was very difficult to judge as to the exact influence that any local treatment might have on the amelioration of these local symptoms, and for the number of successes that had been reported following the treatment of urethral lesions there were just as many, if not more, absolute and dismal failures.

Dr. William B. Pritchard said he agreed entirely with the sentiments expressed by Dr. Sachs. During the past week or ten days the speaker said he had seen three tabetics who had been subjected to local urethral treatment by the "expert" referred to, without resulting benefit except in one instance, and in that case the incontinence was relieved, not by treatment directed to the urethra, but by the removal of a vesical calculus by another physician by a non-cutting operation, the existence of the calculus never having been suspected or detected during the period of urethral treatment. Dr. Pritchard said he had recently received a communication asking him to revive a discussion of this method of treatment in tabes. Personally, he thought the subject had already received too much and too serious consideration. He believed it highly advisable that it should not be further discussed or indorsed, and that the claims that had been made for it as a specific should be disregarded and all further consideration of the matter by the Society should be dropped.

Dr. Starr, replying to Dr. Pritchard, said he thought a *quietus* could best be placed on this method and the claims that had been made for it by definite statements from authoritative sources, such as had been made at this meeting. The experience of those who had given the method a thorough trial condemned it utterly and entirely as a cure for locomotor ataxia, and their statements to that effect should carry a great deal of weight.

Dr. Edward D. Fisher said that in his own experience, tabetics had received no benefit from treatment directed to the urethra. The relief derived from the correction of any local lesion in these cases, however, was another question. The speaker recalled one case where a minor operation about the rectum and the passage of the urethral sound on several occasions were followed by an immense improvement in the patient's sensory symptoms, but there was no improvement in the urinary incontinence nor in the disease itself. This phase of the subject had possibly led neurologists to pay closer attention to the bladder condition in locomotor ataxia.

RECOLLECTIONS OF HUNTINGTON'S CHOREA AS I SAW IT
AT EAST HAMPTON, LONG ISLAND, DURING MY
BOYHOOD

By George Huntington, M.D.

He prefaced his remarks with the statement that he had seen practically no cases of Huntington's chorea during the long period that had passed since the presentation of his original paper, now thirty-seven years ago, and that without the facts and observations handed down to him by his grandfather, Dr. Abel Huntington, and his father, Dr. George Lee Huntington, the medical lives of whom were both spent in East Hampton, L. I., he could never have formulated a picture of the salient characteristics of the disease so true and so complete as to make of it a so-called classic.

Old East Hampton was settled by the English in the year 1649, and was first called Maidstone, after the old home of many of them in England. They had spread eastward from Southampton, whither they had come from New England, principally from Saybrook and its vicinity in Connecticut, and settled several years prior to the settlement in East Hampton. With these earliest settlers, in all probability, came the disease under consideration. When Dr. Huntington's grandfather came to eastern Long Island from Connecticut in 1797, he found the disease well established there, but had little or no call to treat it, though he undoubtedly treated many choreics for intercurrent disease, and was thus more or less intimately acquainted with them. The same was true of his father, who was a native of East Hampton. Years of contact with these people taught them their peculiarities; the age at which the disease generally manifested itself, its usually slow onset and gradual development, sometimes through long lives, sometimes for only a short period: for these people often ended it all by suicide before its worst features had time to develop. Some worked at their trades long after the choreic features had developed, but they gradually succumbed to the inevitable, becoming more and more helpless as time advanced, and often mind and body failed with even pace.

Dr. Huntington said the postulates taken in his original paper he believed held good to-day, namely: The appearance of the disease only in adult life, its chronicity and gradual advancement, its following in direct line from parent to offspring, and when this line was broken, its failure to reappear in future generations.

Speaking of his personal memories of this form of chorea, Dr. Huntington said: "Over fifty years ago, in riding with my father on his professional rounds, I saw my first cases of 'that disorder,' which was the way in which the natives always referred to the dreaded disease. I recall it as vividly as though it had occurred but yesterday. It made a most enduring impression upon my boyish mind, an impression every detail of which I recall to-day, an impression which was the very first impulse to my choosing chorea as my virgin contribution to medical lore. Driving with my father through a wooded road leading from East Hampton to Amagansett, we suddenly came upon two women, mother and daughter, both tall, thin, almost cadaverous, both bowing, twisting, grimacing. I stared in wonderment, almost in fear. What could it mean? My father paused to speak with them and we passed on. Then my

Samuel-like instruction began: my medical education had its inception. From this point on my interest in the disease has never wholly ceased."

Dr. William Browning said it was always a pleasure to meet Dr. Huntington, and to feel that appreciation was his while he was still alive to enjoy it. Scientifically, Dr. Huntington's original classic had received universal recognition, and every American practitioner must feel encouragement and pride when the individual worker made a contribution of such signal importance.

It was the historical side of this subject, Dr. Browning said, that had largely interested him, but on that point he had had his say, and there was nothing special to add now. There were some points that still needed working out, and no one had the material better in hand than Dr. Jelliffe. The only new point that he could bring up had reference to what might be termed the collateral degenerative neuroses. It had, the speaker believed, been claimed that the tendency in this disease was only to heredity in kind. That might be too narrow a view. Dr. Huntington had told him that the eligibles who did not develop the disorder nevertheless were peculiarly excitable and more than normally responsive to nervous strain. Dr. Browning said he could also mention insanity, paralysis agitans, possibly a group of the family type of muscular atrophy, and even other affections as occurring in the chorea-free descendants. Whether these constituted merely casual acquisitions or were more closely dependent on hereditary weakness was a question. He had hoped to take up this point, but as that was not very likely, he used this opportunity to throw out the suggestion. More than one generation of the chorea-free offspring must be taken into account. As we had the original Simon-pure type here in America, and as it had been followed back farther than elsewhere, we had the best basis for its successful study.

Dr. Smith Ely Jelliffe said the side of the question that had particularly interested him was to try to trace back the various families and their intermarriages, and in this way get as close as possible to the original nucleus of this disorder. In his work, the speaker said he had been assisted by Dr. Edward D. Fisher and particularly Dr. A. R. Diefendorf. One great obstacle he had met with in his efforts to trace back these cases was that in the medical histories no record was usually made of the maiden name of the mother, and thus the family connection was lost. Another puzzling feature of his investigation had been the tracing of the illegitimate children of parents who had been afflicted with this disorder, at least half a dozen instances of this having come under his observation. Dr. Jelliffe said he had been able to trace back these original Connecticut settlers to certain towns and hamlets in England, but there his investigations were consistently blocked. Many English psychiatrists did not seem to recognize Huntington's chorea, and the cases of that disorder that he had seen in the English asylums were variously classified as catatonia, or dementia, or chronic mania. So far as the American cases were concerned, he said he had been able to show that there were at least three nuclei—one in Massachusetts which he had not worked out, one in Connecticut and its direct relation, the one on Long Island. Dr. Jelliffe said he had been able to tie together many of the cases of Lyons, of Sinklers, Waters and others to the Long Island and Connecticut nuclei. His paper, he said, which appears in Dr. Browning's neurographs, was a preliminary report.

Dr. A. R. Diefendorf of New Haven, Conn., said he had been very

much interested in the subject of Huntington's chorea since he saw his first case in Worcester, Mass. When he first came to Connecticut, he saw a large number of these patients in the hospitals there. They came from different localities scattered over the state, but more particularly from along the shore. The speaker said he could not agree with Dr. Huntington that the disease developed only in adult life, as he had seen one case which had its onset at the age of seventeen years.

Dr. Charles L. Dana said he simply arose to express his appreciation and pleasure at the opportunity of hearing and seeing Dr. Huntington, to whom the members of the Society were much indebted for having come here to read his paper. Just as it was always a delight to hear a poet read his own poem, so it was a pleasure and privilege to be able to carry away with them the memory of having seen and heard a man who had helped to make medical history.

Dr. Dana said that Huntington's chorea had always appealed to him as an excellent disease in which to work out and apply the Mendelian theory on the traits of heredity, and he expressed the hope that Dr. Jelliffe had not neglected this feature in his historical study of the cases.

UNILATERAL LAMINECTOMY

By Alfred S. Taylor, M.D.

The speaker said that unilateral laminectomy possessed certain advantages over the bilateral operation universally employed. It was done as follows: The incision was made just to that side of the spinous processes upon which the laminectomy was to be done and was carried close to the spinous processes down to their bases. Large deep rake retractors were used to pull the muscles outward (incidentally stopping the hemorrhage), and a periosteal elevator was used to denude the laminae, to which the muscles were but loosely attached, until they were exposed as far outward as the articular processes. With a Doyen saw the laminae were divided at the bases of the spinous processes and also externally near the articular processes. With a bone forceps the laminae were then lifted out. The operator might prefer to remove one lamina by means of the saw and forceps, and then remove the others by means of special rongeurs. In this way one might obtain spaces 1.8 cm., 1 cm. and 1.5 cm. wide in the cervical, dorsal and lumbar regions, respectively. The dura was opened longitudinally, and after the work for which the operation was undertaken was finished, it was completely closed with a continuous catgut suture. The muscles and aponeurosis were closed with chromic gut and the skin with silk. No drainage was used.

By this method, Dr. Taylor said, he had resected posterior nerve roots three times in the cervical region, the posterior roots on both sides from the seventh to the tenth dorsal, inclusive, without damage to the cord proper, in one case, and the lumbar roots on one side in one case. These cases had shown practically no shock and had healed promptly by primary union, even though one of the patients was a locomotor ataxic of some years' standing. In each of these cases the escape of spinal fluid when the dura was opened was very free, but neither then nor afterward was there any appreciable effect noticeable on the patients' condition.

This operation, when properly performed, gave ample room for any exploratory operation upon the cord, for the removal of many tumors, and, in the case of tumors too large for this route, it indicated just what laminæ of the opposite side must be removed to render easy the extirpation of the growth. In those cases referred to by Dr. Fraenkel in which an anterior tumor had been found at autopsy after an exploratory bilateral laminectomy had failed to reveal it, this method would give less failures, for the exposure was sufficiently lateral to render easy the exploration of the anterior aspect of the cord.

To sum up, the advantages of the method were: Minimum loss of blood and bone, and minimum loss of bony protection to the cord. There was no post-operative deformity of the spine, and no loss of flexibility. The exposure obtained was sufficient for all exploratory work excepting in certain cases of fracture of the spine. It was sufficient for all nerve root work on one or both sides, for the removal of many tumors and for minimizing the operative trauma in others by first exposing their exact size and location. Finally, it lessened the chance of overlooking an anterior tumor.

Dr. Starr said that Dr. Taylor's paper offered some very valuable suggestions for exploratory operations on the spine. We knew that in the vast majority of instances of spinal tumors that came to operation, the surgeon, as a rule, opened the spinal canal too low down, necessitating an enlargement of the opening upwards. To remedy this error, Horsley had suggested that after locating the tumor, the opening in the spine should be made four inches above the surface indication of the anesthesia. While this was a good general rule, it was not sufficiently accurate, and in view of the fact that we were a little uncertain as to the exact location of these spinal growths, would it not be a good scheme to do a unilateral laminectomy, as described by Dr. Taylor, and locate these tumors exactly before attempting removal?

Periscope

Archiv für Psychiatrie und Nervenkrankheiten

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XXVIII. Acute Paranoia. THOMSEN.

XXIX. Technique and Results of Lumbar Puncture. E. JACH.

XXX. Contribution to the Study of Neural, Progressive, Muscular Atrophy. KONSTANTIN v. KÜGELGEN.

XXXI. Contribution to Conjugal and Family Syphilitic Diseases of the Central Nervous System. E. MEYER.

XXXII. A Case of Progressive Neurotic (neural) Muscular Atrophy associated with Manic Depressive Insanity and So-called "Maladie des tics convulsifs." A. WESTPHAL.

XXXIII. Contribution to the Study of Developmental Diseases of the Brain. PIETRO RONDONI.

XXXIV. The Pathogenesis of Pseudo-Bulbar Paralysis. ALFONS JAKOB.

XXXV. Aphemia and Apraxia. RAECKE.

XXVIII. *Acute Paranoia*.—On the basis of 24 cases Thomsen discusses the question of acute paranoia and attempts to prove the existence of such a disease. The conclusions of the paper are in general as follows: Kraepelin's conception of chronic paranoia is too narrow and corresponds only to occasional cases; chronic paranoia is in its symptomatology and course primarily a disease of the intellect of functional character; recovery is by no means a great rarity although certain forms show a definite tendency to chronicity; in some cases outcome in dementia occurs. The diagnosis of acute idiopathic paranoia is only to be permitted after it has been determined that the clinical picture is not a part of another psychosis or does not represent chronic paranoia. It is likewise essential to exclude specific etiological factors in the diagnosis, particularly alcohol, intoxications, puerperium, severe injuries and exhaustion. Excluding these conditions it is possible to make a diagnosis of acute paranoia and to venture the belief in a favorable outcome. Acute paranoia as also chronic paranoia has nothing to do with amentia and the peculiar disease pictures of young persons which Kraepelin has described as dementia præcox. The diagnosis of acute paranoia is often confused with that of manic depressive insanity and at times in periodic paranoia the differential diagnosis is impossible. Individual cases when the entire history and character of the individual are considered are often not difficult and the outcome must ultimately determine the correctness of the diagnosis.

XXIX. *Lumbar Puncture*.—Jach reports the results of 200 lumbar punctures among 164 insane and epileptic persons, together with certain matters regarding technique, particularly of the microscopic examination. The details of the research are given in a table. In general, in paralytics and persons ill with syphilis of the central nervous system there was invariably an increase in cellular elements. The results in other mental diseases and in persons with genuine epilepsy, idiots, and others were less

striking, but showed many alterations which are at least suggestive of diagnostic significance. The amount of albumin showed a striking increase in most of the paralytic cases, but not in others investigated. Attention is drawn to the fact that nothing definite is known regarding the origin of the cells found in the cerebro-spinal fluid.

XXX. *Neural Muscular Atrophy*.—Kügelgen after briefly stating the three groups of primary muscular atrophy as follows—dystrophy or myogenous form, spinal or myelogenous form; and neural or neurogenous form—discusses at length with very complete reference to authorities the latter form, together with its diagnosis, therapeutics and prognosis. The paper is a valuable résumé of our knowledge of this subject.

XXXI. *Syphilis and Heredity*.—In this article Meyer takes up the difficult question of the conjugal and family diseases of the central nervous system on the basis of syphilis. He very properly draws attention to the relative paucity of statistics on this subject and urges the necessity of investigating the entire family history in cases where certain members are afflicted with general paralysis or tabes. Following out this general idea during three years a careful study of 85 undoubted paralytics was made, among whom 50 of the men were married. The wives of 14 of these men were examined. Of the 25 women 15 were married, and it was possible to examine the husband in four cases. The result of this investigation, although based on an inadequate number of cases, is of considerable interest in relation to the general subject. A general conclusion is that a previous syphilitic infection is a necessary precursor for both general paralysis and tabes. All such cases are, according to Meyer, to be regarded as syphilogenous diseases even if the proof of infection is lacking. From this it follows that the number of organic nerve diseases on this basis is distinctly greater than was previously generally assumed. The hypotheses of the methods of production of the parasymphilitic infections are briefly discussed.

XXXII. *Neural Muscular Atrophy*.—Westphal reports with careful microscopic examination a case of neural muscular atrophy associated with mental disturbance and ties. An interesting finding is the probability of newly formed nerve fibres in the nerves of the lower extremities. In other words the observation seems to show that even in paralysis of many years' duration anatomically demonstrated regenerative changes may be found in the nerves.

XXXIII. *Developmental Diseases of Brain*.—Rondoni reviews in this article our knowledge of the developmental diseases of the brain. In Part I of his paper hereditary brain syphilis and juvenile progressive paralysis are discussed. Three cases are reported in varying detail and the general conclusion reached that these cases constitute a strong anatomical proof of the congenital inadequacy of the central nervous system as a cause of the onset at least of juvenile paralysis, in this instance developmental anomalies occurring on a syphilitic basis. In the second part Rondoni takes up the question of the formation of the strata of the brain cortex under normal and pathological conditions. This technical discussion does not permit of brief abstraction, but is well worthy of study on the part of those interested in the development of the cortex and its deficiencies in conditions of disease.

XXXIV. *Pseudo-bulbar Palsy*.—In this article Jakob offers a monographic account of the pathogenesis of pseudo-bulbar paralysis with numerous case citations of other authors to which is added a single per-

sonal case. The anatomical conclusions are in general that the mesial "Haubenfussschleife" (v. Monakow) passes with the pyramidal tract into the anterior portion of the anterior corpus quadrigeminum. In its further course it lies in the mesial fifth of the pes. The frontal pons tract contains in addition to fibres from the prefrontal region also fibres from the dorsal portion of all the frontal convolutions, and lies in the pes, mesial from the pyramidal tract. Degenerations of the frontal and temporal pons tracts do not affect the middle cerebellar peduncle. Pathological-physiological conclusions are in part as follows: The cause of pseudo-bulbar paralysis is to be sought in small lesions, usually of both hemispheres, which interrupt the projection fibers from the operculum to the bulbar nuclei. These lesions for the most part lie beneath the cortex. Usually a bilateral disease of the cortex is necessary to produce the pseudo-bulbar symptom-complex, although it may occasionally occur through a one-sided lesion. Involvement of the pyramidal tract is usual, but not essential. The clinical appearances may be regarded as paretic-ataxic. In general, paralysis associated with marked disturbances of coördination is characteristic of the affection.

XXXV. *Aphemia and Apraxia*.—Raecke reports in detail a case of aphasia and takes occasion to discuss briefly the present situation regarding the aphasic question in general. Raecke's observations support Liepmann's recent critical study as against Marie.

E. W. TAYLOR (Boston).

Deutsche Zeitschrift für Nervenheilkunde

(Band 36. Heft 3 and 4. 1909)

2. Relation of Genuine Epilepsy to Symptomatic Epilepsy. REDLICH.
3. Dermoid in Spinal Canal with Duplication of Cord. HARRICHHAUSEN.
4. Treatment of Sciatica by Infiltration. RAIMIST.
5. Hematomyelia Complicated with a Traumatic Neurosis. RESNI KOEV and JOSEFOVITSCH.
6. Serum Reaction in Syphilis. EICHELBERG.

2. *Genuine Epilepsy and Symptomatic Epilepsy*. The writer discusses the relationship of these two, after a comprehensive survey of the literature, both from the etiological, clinical and pathological viewpoints. With the exception of heredity, which is the most important factor favoring a genuine rather than a symptomatic epilepsy, most of the noxa are capable of producing convulsions in both forms. Pathologically in the larger proportion of cases macroscopic and microscopic changes are found, but are not of a definite character to separate the two forms.

3. *Dermoid in Spinal Canal*.—Patient, æt. 23, following a fall on his back developed several months later, mild pains in the left leg and gradual weakness. Examination showed, one year later, paralysis of left leg, and loss of sensation and reflexes. Pain on pressure over lumbar vertebræ. Diagnosis of tumor of the conus was made. Gradual improvement for three and one-half years. The symptoms then recurred and also weakness of right leg; a hyperalgesic area was noted at the level of the seventh and eighth thoracic. Former diagnosis discarded, and tumor located at the sixth thoracic. Operation failed to reveal any tumor. Death 4 months later from transverse myelitis. At necropsy a dermoid cyst was found under the dura at the first and second lumbar. It was not

attached to it. The dermoid measured 5 cm. long and 2.5 cm. wide. The tumor lay in a bifurcation of the spinal cord, which began 11.5 cm. above the end of the cord and 2.5 cm. above the upper pole of the tumor. The right half of the bifurcation was larger than the left. Both halves showed nerve roots. These two portions were surrounded by a common pial sheath. In the region of the tumor the two halves were separated 4 mm. from each other. Section of the cord showed the usual degeneration of a transverse myelitis. Of especial interest were the changes found in the form of the cord. The central canal 2 cm. above the bifurcation showed a loss of its lumen and an irregular arrangement of its cells. In the next series of sections it was seen divided into two separate canals. Each half showed its anterior and posterior horns. The gray matter had rotated through an angle of 90°, so that the anterior horns of each half faced each other, the septum of glial tissue separating them.

4. *Treatment of Sciatica*.—The writer used the method of Lange with the variations that he did not force in the fluid, but allowed it to go in by its own weight. The 28 cases showed the following results: 75 per cent. cured, 21 per cent. improved and 4 per cent. unimproved.

5. *Hematomyelia and Traumatic Neurosis*.—Clinical case.

6. *Serum Reaction in Syphilis*.—Analysis of 1,200 blood sera and 350 spinal fluids and a discussion of the more muted facts. He concludes as follows: The Wassermann reaction is found in the blood serum of patients who have had syphilis. In paresis, tabes and cerebrospinal syphilis it is also found in the cerebro-spinal fluid. Also in other protozoan diseases, furthermore, it is found in scarlet fever, idiopathic epilepsy and in isolated cases of pneumonia, typhoid, tuberculosis, diabetes and tumor. The Wassermann reaction has not proven conclusively that paresis and tabes are syphilitic diseases, because the primary theoretical supposition has been proven incorrect. The Wassermann reaction is of practical value in the diagnosis of syphilis. It gives no certain data as to whether a case is cured or not, and therefore has no practical value in relation to the therapy.

(Band 36. Heft 5 and 6. 1909)

7. Contribution to the Pathology of the Meninges. QUINCKE.

8. Clinical Contribution to the Subject of Syringomyelia and Hematomyelia. PETRÉN.

9. Clinical and Pathological Studies of Atrophic Lobar Sclerosis of the Brain. ZINGERLE.

7. *Pathology of the Meninges*.—Continued article.

8. *Syringomyelia and Hematomyelia*.—Report of several unusual cases.

Case I. A case of syringomyelia with syringobulbia a pure spastic type with almost unilateral symptoms. Duration 34 years. The symptoms included dissociation of sensation, namely loss of pain and temperature with preservation of tactile sensation in the region of the left trigeminus and right upper cervical. Complete anesthesia of the left arm, extension also to region of the upper cervical and upper left thoracic nerves of the same side. Hypalgesia and thermohypesthesia and normal tactile sensation in the right trunk and right leg. The right side of face and arm, and the lower portion of the left trunk and left leg were normal. The hemibulbar symptoms, besides the sensory disturbances, were paralysis of the voice, left faucial pillars and atrophic paralysis of the spinal accessory. Spastic paralysis of the legs, especially the left, was noted.

The picture of this case differs in many respects from the usual forms, firstly in the absence of any atrophy of the anterior horn cells, and secondly in the unilateral character of the symptoms indicating the marked involvement of the left portion of the spinal cord.

Case II. Considered as syringomyelia but which in its course and certain added symptoms of a spinal meningitis indicated the association of a syphilitic process. Patient æt. 56. Onset with pains in loins followed by paresthesia, girdle sensation and weakness of the legs. Examination four years later showed kyphoses in lumbar region, spastic parietic lower limbs, disturbance of muscle sense, and marked disturbance of tactile, pain and temperature sensations. Reflexes were retained. Multiple sclerosis and pseudo-systemic disease were excluded, though the latter had been considered a possible diagnosis, but in later years the further course of the disease and the atrophic paralysis in the left hand justified his conclusions. The author concludes that it may probably be a syringomyelia in association with syphilis.

Case III. Symptoms those of a syringomyelia but with the unusual localization in one leg. The patient following a forcible stretching of the right sciatic nerve developed a paralysis of the limb, which temporarily improved during the next year, but remained stationary for the following fifteen years. The fact that the onset was sudden, and that the symptoms did not develop progressively make the diagnosis one of hematomyelia.

9. *Atrophic Lobar Sclerosis*.—Zingerle reports a case which clinically showed a symptomatic epilepsy, with mental feebleness and states of confusion, but no localizing nervous symptoms. Pathologically a diffuse atrophic sclerosis of the different convolutions of the brain was noted besides two sclerotic areas in the white substance. Microscopically no changes were noted in the blood vessels, nor was the process limited to the vascular distribution. A diffuse overgrowth of glial tissue was noted together with degeneration and disappearance of the nerve elements. The possibility of an atrophic lobar sclerosis is to be considered in cases of epilepsy with progressive weakness of mind.

S. LEOPOLD (Philadelphia).

Journal de Psychologie, Normale et Pathologique

(Sixth Year, No. 5. Sept.-Oct., 1909)

1. The Perversities of Character among Hysterics. P. HARTENBERG.
2. The Smile and the Laugh in Dementia Præcox. PASCAL AND NADAL.
3. Revery and Delirium of Grandeur. P. BOREL.
4. An Illustration of Interpretative Delirium. R. DUPONY.

1. *The Perversities of Character Among Hysterics*.—Most of the writers upon hysteria declare that lying, duplicity, trickery, folly, simulation, vanity, coquetry, impudence and other wayward manifestations of character are among the typical features of the disease. A few, however, among them Hartenberg, maintain that while these perversities may be observed among hysterics, they are in no sense symptoms of the disease. Not only does hysteria occur without them but when present they are not more frequent or pronounced than they are among normal individuals. It is not their mere presence in hysteria that makes them noteworthy but

rather the peculiar mode of their exhibition. For example, lying is not in itself a trait of the hysteric but the manner of the lying, the elaboration of the falsehood, the introduction of so much unnecessary and irrelevant detail in the false story are what gives the hysterical complexion to this symptom when it is present. And so with all the other perversities of character so much spoken of among the authors.

2. *The Smile and the Laugh in Dementia Præcox*.—Pascal and Nadal insist that a close study of the clinical features of the smile and the laugh of those afflicted with dementia præcox will afford very material assistance in the diagnosis of this disease and some other psychopathic and demented states. The article is so occupied with illustrative cases and the discussion is so elaborate clinically, psychologically and medico-legally, that it is quite impossible to prepare a satisfactory abstract.

3. *Revery and Delirium of Grandeur*.—The study of the state of revery, as has already been done by Pierre Janet in 1898 and by Binet in 1900, promises much for pathological psychology. Especially has this seemed to be the case since the publication of Janet's work upon the disturbances of the "function of the real" and upon the oscillations of the mental level. In the present article, which is richly illustrated with case reports, Borel endeavors simply to demonstrate the rôle which revery performs in the genesis of a certain number of the delusions of grandeur and to establish the connection which obtains between the latter and some of the commonest phenomena of normal mentalization.

4. *An Illustration of Interpretative Delirium*.—This is a long and detailed report of an interesting case in which the receipt of a commonplace, courteous note, written by the secretary of the Empress Eugénie in acknowledgment of one addressed to her by the patient, led to the latter becoming obsessed with the idea that he was somehow the special protégé of the former. This obsession, though most unwarranted and based upon the courteous formulæ usually employed in formal communications, was the origin of a whole series of deductions and actions that would have been wholly logical and natural had the obsession that originated them been reasonable and true. The false and delirious interpretation, as it were, of a few meaningless words of courtesy, had led to the most extravagant, unheard-of acts on the part of the patient, causing his arrest and incarceration many times, and his ultimate confinement in an asylum as a hopeless dement.

L. H. METTLER (Chicago).

Revue de Psychiatrie et de Psychologie Expérimentale

(Sept., 1909)

1. Nineteenth Congress of Alienists and Neurologists of France and French-speaking Countries.

1. *Congress of Alienists and Neurologists*.—The entire number is taken up with a report of this congress. The several communications are already abstracted and will hardly bear further condensation.

(Oct., 1909)

1. Urine and Blood Toxicity in Psychiatry. A. MARIE.
 2. The Sixth International Congress of Psychology. M. MIGNARD.
1. *Urine and Blood Toxicity*.—The author, from his experience, be-

lieves that there is an incontrovertible relation between the toxicity of the blood, the toxicity of the urine, and the chemical composition of the urine.

2. *Congress of Psychology*.—This is a digest of the various papers presented and will not bear further abstraction.

(Nov., 1909)

1. The Psycho-physiological Theories of Language in Aphasia and Mental Alienation. BRISSET.

2. Autopsies of two Cases of Chronic Chorea with Mental Troubles. DAMAYE.

1. *Psycho-physiological Theories of Language*.—An effort to define the difference between dementia and aphasia. The article, for the most part, consists of quotations on these two subjects.

2. *Chronic Chorea*.—There was found a thickening of the pia affecting nearly the same regions in the two brains predominating in the psychomotor regions then in the occipital and temporal which were least affected. In one case the decortication was easy, in the other adhesions showed a lesser degree of perivascular inflammation. Both presented a process of meningo-encephalitis, though in one case the process was much slower than in the other. In both cases the neuronophagia was intense and in all stages. Kéraval and Raviart have insisted on this same fact. In their patient the round cells, as in paresis, formed a complete envelope about the smallest vessels and capillaries. In both cases, from a clinical point of view, the patients were demented.

(Dec., 1909)

1. Observations on the Memory in Young Adolescents and the Insane. DUPRAT.

1. *Memory*.—This article contains nothing that is new or worth while incorporating in an abstract.

WHITE.

Zentralblatt f. Nervenheilkunde und Psychiatrie

(Bd. 20. July 1 and 15, 1909)

Apropos of Coagulative Process of the Blood Serum of the Epileptics. D. C. BESTA.

The Question of Exogenic Psychoses. K. BONHOEFFER.

Anxiety of Sexual Weakness and Coitus as Cause for Impotence. V. BECHTEREW.

Blood Serum in Epilepsy.—The main substance of this article is a reply to Besta's critics who have misquoted him. He maintains that epileptic convulsions bear some relation to the alteration of the blood composition in which the fibrin ferment is reduced.

Exogenic Psychoses.—Manic symptoms on exogenic grounds often occur, but they differ from manic depressive insanity of endogenic nature. The author describes three cases (two had trauma to skull and one with cardiac insufficiency and hydrops) in which manic features were per-

ceptible. However, the entire course of the disease process was peculiar. He concludes that traumata may produce acute symptomatic pictures of different nature. It would be advisable to speak of psychic reaction forms of exogenic traumatic type. A sharp and complete symptomatic differentiation between exogenic disease pictures and disease states of endogenic type is rather impossible. "If we cannot speak of a pathognomonic exogenic psychical type, then we must admit a psychical predilection type of an acute exogenic disturbance."

Impotence.—V. Bechterew discusses the so-called impotentia coeundi and describes several cases in which this symptom was present. The treatment consisted in bromide, codein mist., hydrotherapy, and suggestion.

(August 1 and 15, 1909)

Apropos of Dream-like and Allied States. L. LOWENFELD.

Dream Life.—These peculiar states are characterized mainly by a feeling of unreality. The external world does not appear real; the usual impressions seem strange, new, or as if they were unknown; the entire vicinity is regarded as a phantasy or vision. In the last instance especially, the patients find themselves in a dream, or they are half asleep, hypnotized or somnambulistic. They speak usually of their dream-like states. These vary in intensity and duration—may last from a few minutes to a half an hour or day or longer. As a rule other nervous and psychotic symptoms are present. These cases are divided into two groups—one in which the feeling of unreality or the feeling of a dream-like experience is demonstrable and in the other both of these conditions exist synchronously. This peculiar state may occur in neurasthenia, anxiety and compulsive neurosis, melancholia, dementia præcox and, according to Pick, in epilepsy. However, it may occur independent of any other disease and the author describes twelve such cases.

M. J. KARPAS (Berlin, Germany).

MISCELLANY

A CLINICAL CONTRIBUTION TO THE QUESTION OF THE EXOGENIC ORIGIN OF MULTIPLE SCLEROSIS. Dr. Borchardt, Oberarzt an den Neurologischen Klinik, Charité, Berlin. Charité Annalen, XXXII.

Borchardt made a very interesting study of multiple sclerosis in regard to its etiology and came to the following conclusions: (1) The so-called multiple sclerosis in the sense of Schmaus which are characterized anatomically by reparative glia proliferation originally developing through inflammation or degeneration of altered nervous tissue, originate in general on bases of exogenic injury, infection, intoxication, etc. (2) The so-called true multiple sclerosis in its narrow sense (according to Müller) is developed, in a majority of cases, without a demonstrable exogenic cause, probably on the ground of endogenic injury, a special predisposition of the nervous system. (3) A number of cases, which apparently originate from exogenic causes, show indications of endogenic factors in the sense of a peculiar predisposition. (4) In none of his cases (his material consisted of fifty cases) evidences for exogenic causes could be elicited.

M. J. KARPAS (Berlin, Germany).

Book Reviews

UBER DIE KERNE DES MENSCHLICHEN RÜCKENMARKS. Von L. Jacobsohn, Königl. Akademie der Wissenschaften. Berlin.

THE MIDDLE CELLS OF THE GRAY MATTER OF THE SPINAL CORD. By J. H. Harvey Pirie, B.S., M.D., M.R., C.P. Proceedings of the Royal Society of Edinburgh.

VOM AUFBAU DER MITTELZONE DES RÜCKENMARKS. Zdzisław Reich. Arbeiten aus dem Neurologischen Institute, Prof. Dr. Heinrich Obersteiner. Vol. 17. 1908. Heft 2.

These three studies of the cells lying about the juncture of the anterior and posterior horns of the spinal cord are of interest at this time, since the anatomical analysis of the cord nuclei is being carried on by serial sections. Waldeyer originally described these cells. Argutinski studied them more fully as did Bruce.

Pirie's studies were made on the spinal cord of a full-grown fetus, and in all he cut 16,000 sections. He shows that the middle cells are present throughout the whole length of the spinal cord. They are situated in the middle region of the gray matter, between the free anterior and free posterior cornua; but they sometimes also extend into the regions usually occupied by the anterior cornual cells, by the intermediolateral tract or by Clarke's column. The small cells in the base of the anterior horn (scattered cells) cannot be sharply separated from the middle cells, nor can most of the small cells about the base of the free posterior horn.

Although some of the middle cells may be found in all this wide area of distribution at practically any level of the cord, there are certain arrangements of cells which may be looked upon as typical of each segment, or at least of each region of the cord. In the upper cervical region they are not on the whole very abundant (this differs from Waldeyer's account), but are best developed in the central and para-central fields. In the cervical enlargement they are much more numerous, particularly within a broad band extending from the formatio reticularis to about the anterior gray commissure. Throughout the dorsal region they are again comparatively few in number, and may be scattered irregularly; but small groups are often found, most commonly in the central area, about on a level with the central canal, and in the post-central area, between Clarke's column and the reticular group of the intermedio-lateral tract. In the lumbar segments the middle cells are abundant, particularly centrally and in the base of the anterior horn. Their field extends anteriorly, until in the lower sacral region they come to be found over the whole area of the anterior cornua in addition to their more usual situations.

At all levels, as studied in serial sections, the distribution of the middle cells is seemingly erratic and casual. No regular plan of arrangement can be made out, and there is most certainly no segmentation (as Argutinski described) like that so well seen in the intermedio-lateral tract. The cells are sometimes just dotted here and there singly; sometimes they are scattered fairly thickly and evenly over the whole or part of the regions they are to be found in; or again, they may occur more

thickly in one part, or be aggregated into a distinct little cell group or nest, but even these cell groups are seldom so closely packed as are the cell groups of the intermedio-lateral tract. The duration of any one of these types of cell arrangement is inconstant; and although there are levels where cells seem for a bit to be almost level in one place, this much can be stated as a general rule, that no middle cell group lasts through more than a very few serial sections. If traced further, the group is found either to shift to some other area or to die out altogether. Occasionally there appears to be a variation in number of cells parallel with the oscillations of the intermedio-lateral tract, but closer study shows that this is by no means absolute, and is probably only a local accidental variation.

Without expressing any opinion as regards function, Pirie is inclined to divide the cells he has described into three groups, basing this division merely on the distribution and arrangement of the cells and on the microscopic appearances of the cell bodies. These divisions are, however, not very sharply defined either as regards the character of the individual cells or in cell distribution. Still they seem to warrant such a distribution being made, and to suggest at least that the cells of the three groups may be functionally different. The groups he would make are:

1. The middle cells proper, or central cells, occurring chiefly in the central area of the gray matter. These cells are of medium size and very similar to those of the apical group of the intermedio-lateral tract, multipolar, polygonal or rounded polygonal in outline, with a comparatively large nucleus and a few chromatic granules round it in the cell substance. Sometimes scattered, but more often present as a small clump of cells. With them may be included the cells in the para-central area, which, although sometimes forming a distinct and separate aggregation of cells, can mostly not be separated off from the central cells. Many of the cells occurring in the reticular area at levels where the reticular group of the intermedio-lateral tract is not present (especially in the lower cervical region) may probably also be included here.

2. Anterior central cells in the base of the anterior horn—one of Waldeyer's "scattered" cell groups. As his name implies, these are often simply scattered over the area in question, but sometimes they are gathered into small cell-nests, but rarely very compact ones. Although there is no sharp boundary between them posteriorly and the central cells, they are in the main larger cells, and are further distinguished by their shape. They are not so often definitely multipolar and of approximately equal diameter in different directions, but more frequently appear to be bipolar, with long-drawn-out processes. The axis of elongation may be variously oriented. With these would fall to be included the middle cells in the external central area of the lateral enlargements, particularly in the lumbo-sacral cord. Possibly also some of the para-central cells should be classed with this group and not with the previous one.

3. Post-central cells. These lie in the area between Clarke's column and the *formatio reticularis*, or in the corresponding region of the grey matter at level where Clarke's column is unrepresented. As with the anterior central cell, there is no sharp boundary between this series and the central middle cells. They are often continuous, or the cells may lie betwixt and between the two areas. But although many of the posterior cells may be as large, they are distinguished on the whole by being smaller in size than the central cells, and less definitely polygonal, more

rounded in outline. They are generally present either as a small clump or as a band of cells on the outer and posterior aspects of Clarke's column. Posteriorly it is very difficult to separate this group from the postero-basal and postero-marginal cells of Waldeyer. With this group may be included cells present in the area of Clarke's column, particularly when that column is absent or only represented by occasional cells. Also some of the small cells found in the reticular formation, especially those lying between (vertically) the nuclei of the reticular group of the inter-medio-lateral tract.

These subdivisions may require modification from subsequent investigations, particularly by tracing the course and formation of the cell processes. Pirie has attempted to do this by means of Cajal's silver impregnation methods, but, so far, says he has not succeeded. He simply affirms that the fibres arising from the middle cells run in a variety of directions to begin with; but as some could be traced far enough to be seen doubling more or less sharply upon themselves, this gives no real clue to their destination. In no case could he follow any one to a termination. In some cells there was observed an endo-cellular fibrillary network, similar to that in the large motor cells of the anterior horn. In this particular cord the following figures give approximate average diameter of the cells of the different groups:

Anterior motor cells.....	.023-.035 mm.	
Anterior central middle cells.....	.018-.023 mm.	
Central middle cells.....	.015-.018 mm.	
Post central middle cells.....	.011-.015 mm.	
Apical group	} intermedio-lateral tract..... {	.018 mm.
Reticular group		
In lower sacral010 mm.
Clarke's column020-.027 mm.

Jacobsohn's paper appeared about this same time, but he discusses the entire cord so far as its cell groups are concerned. His is the most complete and most valuable paper we possess on the cell groups of the spinal cord. With reference to the middle cells he describes them as the *tractus cellularum*, scattered over the whole grey matter, and forming no very definite groups or nuclei, but three series may be distinguished: (a) an antero-median group, lying along inner edge of the anterior horn; (b) a postero-median group, the smallest of the three, and also composed of the smallest cells, in the position of, amongst, or surrounding Clarke's column; (c) a lateral intercornual series, the largest, near the formatio reticularis, and in the outer part of the base of the posterior horn. All three series are indefinitely bounded towards the center of the grey matter, and may be met there.

This author, in addition to a thoracic and a sacral sympathetic nucleus (intermedio-lateral tract), describes a third or lumbo-sacral median sympathetic nucleus extending from L. 4 to the coccygeal segment, which would include practically all the cells described by Pirie as an extension of the middle cells into the lateral enlargement of the anterior horn as the motor groups die out. According to Jacobsohn the spino-cerebellar paths of the cervical region arise from the middle cells of the cornu although there are large and characteristic cells occasionally seen in the situation of Clarke's column in the cervical cord.

Reich's studies are largely comparative. He has studied man, the orang, lemur, various monkeys, cat, dog, lion, bat, and a number of herbivora and carnivora. Reich takes the general position that the cells all belong to Clarke's columns both anatomically and physiologically.

JELLIFFE.

LES MALADIES MENTALES DANS L'ARMÉE FRANÇAISE. By Drs. Antheaume and Roger Mignot. Paris, H. Delarue & Co., editors, 1909.

This work is the result of first-hand observation by the authors in their service at La Maison Nationale de Charenton, the military hospital for the insane near Paris. It is divided into four parts. The first is general in character and largely statistical. The second considers the varieties of mental maladies observed in the French army. The third deals with medico-administrative and medico-legal questions. The fourth is comprised of various extracts from the laws, regulations, etc., bearing on the subject.

The first portion of the book (statistical) shows that there has been a great increase in the number of mental cases in the army in the period from 1877 to 1904. The particular features of this increase is that it is most marked for cases of idiocy and imbecility. It is noteworthy, too, that during this same period the number of cases of paresis has remained relatively constant.

In the second portion of the book mention is made of nostalgia which is described as a form of melancholia with an obsessing idea. The *dés-équilibres* of Régis, which he defines as constituting the transition between the normal and the pathological, are found to break down under the stress of army life, such as fatigue, climate, infections and in addition excesses, particularly alcoholic and syphilis. Cranial traumatism, particularly as a result of accidents while riding, may be said to constitute a veritable professional malady. Paresis may result but the authors believe only in those predisposed. This sequence is so frequent that they think it may account for the frequency of paresis in the army. They make the interesting point that paresis affects those of large physical development. The paretics were not only larger men than the *vesaniques* but were of larger mean size than the mean size of the French as a nation. Dementia *præcox* is especially important from a medico-legal standpoint, the authors say, because they think it may be preceded for a considerable time by moral perturbations only recognizable by the skilled observer and therefore not usually noted.

The third portion of the book deals in detail with the relation of mental alienation to the military establishment. There is no question but there are many insane in the army. They constitute a distinct danger and should be weeded out by a severe selective process. The rigors of army discipline constitute a veritable touchstone of cerebral equilibrium. The defectives show up not only by developing psychoses but by coming into conflict with the conventions, laws, and regulations of the army. The authors discuss the various offenses: insubordination, failure to observe regulations, illegal absences, and desertion. In connection with these offenses the authors comment on the fact of the frequency with which insanity is overlooked and advocate the preliminary mental examination of an accused. As to simulation the authors are inclined to the belief that most cases, at least, have a primitive make-up. Soldiers lie and simulate easily because they are of child-like mentality. True simulation is rare, but they observe a condition they call semi-simulation.

The fourth part of the book is quite technical and contains copies of documents only of interest in France except, finally, the conclusions of a report on mental alienation in the army presented to the Congress of Nantes.

The work is a distinct contribution to military psychiatry, a subject the United States is miserably behind in as compared to European powers.

WHITE.

LES FOLIES RAISONNANTES. Le délire d'interprétation. Par les Docteurs P. Serieux et J. Capgras, Médecins des asiles d'aliénés de la Seine. Felix Alcan, Paris. 7 francs.

The English student of French psychiatry has often been struck by the singularly happy faculty possessed by many of their authors of being able to paint a living picture where so often one is asked to consider a group of statistical studies. The beautiful work of Magnan on his chronic systematized delusional states was shared in by the senior author of the present monograph and one approaches it with the hope of finding some of the genius of the earlier work. Nor is one disappointed.

The present authors point out that delusions of interpretations are capable of developing as an isolated system and are therefore the legitimate subject of a place in a nosological scheme is ably maintained in the present volumes. It is to be detached from the larger group of the chronic systematized delusions-paranoias.

It is a chronic systematized psychosis characterized by (1) a multiplicity and organization of delusional interpretations, (2) by the absence or poverty of hallucinations or their relations, (3) by the persistence of the lucidity and psychical activity, (4) by the evolution, by progressive extension of the interpretations and, (5) by incurability without terminal dementia. It is founded on an hereditary psychopathic basis. The individuals may remain in the outside social world but as a rule they become interned because they are usually violent and impulsive.

In reading the clinical characters one meets with the cases that the followers of the Kraepelian school restrict to the true paranoias and it is of interest to note that the French and Kraepelian schools are approaching very closely in this particular field. As is well known Kraepelin has always been a partisan to Magnan's earlier teachings and here one evidently sees the coup de grace of one of Magnan's pupils to Kraepelin's teachings. It may be remarked in passing that Serieux and Capgras show a good grasp of current German psychiatry. The work is one worth reading both as a clinical presentation and as evidence of the rapprochement of views on the vexed paranoia question and what it should and should not include.

JELLIFFE.

Notes and News

PRELIMINARY PROGRAM OF THE MEETING OF THE AMERICAN NEUROLOGICAL ASSOCIATION

TO BE HELD IN WASHINGTON, MAY 2, 3 AND 4, 1910

Dr. Harvey Cushing, Baltimore, Md., Oculomotor Palsies due to Vascular Constriction in cases of Brain Tumor. Dr. D. J. McCarthy, Philadelphia, Pa., Pathogenesis of Abnormal Fat Condition. Dr. Smith Ely Jelliffe, New York City, N. Y., Predementia Præcox; The Hereditary and Constitutional Factors of the Dementia Præcox make-up. Dr. Adolf Meyer, New York City, N. Y., The General Conception of Dementia Præcox. Dr. August Hoch, New York City, N. Y., The Mental Mechanisms in Dementia Præcox. Dr. S. D. W. Ludlum, Philadelphia, Pa., Study of the Blood in Nervous Diseases. Dr. H. H. Donaldson, Philadelphia, Pa., On the Percentage of Water in the Brain and Spinal Cord of the Albino Rat, and in the Brain of Man. Dr. Howell T. Pershing, Denver, Col., Fracture-dislocation of the Cervical Vertebrae. Dr. John K. Mitchell, Philadelphia, Pa., Myositis Fibrosa following Nervous Breakdown. Charles L. Potts, Philadelphia, Pa., A Cyst (possibly traumatic) of the Spinal Meninges Removed by Operation with Recovery of the Patient. Remarks on the Location of the Centers for Testicular Sensibility. Dr. Charles K. Mills, Philadelphia, Pa., Tumors of the Spinal Cord and Vertebral Column. Dr. F. X. Dercum, Philadelphia, Pa., (a) Report of Three Pre-frontal Tumors; (b) Sarcomatosis of the Cervical Dura. Dr. Frank R. Fry, St. Louis, Mo., The Slogan of Mental Therapy. Dr. William G. Spiller, Philadelphia, Pa., Friedreich's Ataxia. Dr. T. H. Weisenburg and Dr. S. D. Ingham, Philadelphia, Pa., A Clinical and Pathological Study of Internal Hydrocephalus. Dr. Graeme M. Hammond, New York City, N. Y., A new Type of Pressure Myelitis. Dr. Augustus A. Eshner, Philadelphia, Pa., A possibly Second Attack of Acute Anterior Poliomyelitis in the Same Patient. Dr. F. W. Langdon, Cincinnati, Ohio, Radiculitis of Cervical and Brachial Plexuses, Secondary to Pachymeningitis Externa Cervicalis-Gummatosa. Dr. John H. W. Rhein, Philadelphia, Pa., An Anatomic Study of the Fronto-Occipital Fasciculus, which showed Degeneration as the Result of an Injury into the Tapetum on the Right Side. Dr. Edward D. Fisher, New York City, N. Y., Further Observations on the Ocular Changes in General Paresis and Tabes Dorsalis. Dr. Alfred Gordon, Philadelphia, Pa., Lenticular Zone and Anarthria. Dr. James J. Putnam, Boston, Mass., Personal experience with Freud's Analytic Method. Dr. Theodore Diller, Pittsburgh, Pa., A Case of Tetany with Autopsy Findings. Dr. Sidney I. Schwab, St. Louis, Mo., Muscle Group Isolation and Nerve Anastomosis in the Treatment of the Paralysis of the Extremities. Dr. E. E. Southard, Boston, Mass., A Study of Errors in the Diagnosis of Mental Disease. Dr. E. C. Spitzka, New York City, N. Y., Some Relations of Tuberculosis to Obscure Psychoses. Dr. John Jenks Thomas and Dr. Edward Hall Nichols, Boston, Mass., Report of a Case of Resection of Dorsal Spinal Nerve Roots for Gastric Crises of Tabes. Dr. Alfred Reginald Allen, Philadelphia, Pa., Disturbance of Sensation in a Case of Syringomyelia.

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Original Articles

THE SENSORY FUNCTIONS ATTRIBUTED TO THE SEVENTH NERVE*

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It is first necessary to define what is meant by the seventh or facial nerve as considered in this paper. If by it is meant that efferent trunk which arises from one, or as some hold two, nuclei, first taking its tortuous course through the substance of the pons to its superficial origin, thence through the internal auditory meatus and Fallopian aqueduct to the stylomastoid foramen, to be distributed to various portions of the face, the question would be divested of interest, as the nerve would at once be recognized by all as purely motor. Two other ways of looking at the seventh nerve must however be taken into consideration.

In the first place if the views of Head and his collaborators are accepted the question of an afferent system of fibers traveling in the periphery with the motor facial needs to be discussed. Head, it will be remembered, holds that three different systems of afferent fibers are concerned with peripheral sensibility. Two of these, called respectively the epicritic and protopathic systems, are cutaneous. In consequence of the possession of epicritic sensibility the individual is able to localize light touch, to recognize warmth and coolness, and to discriminate as to one or two points when two are applied. Protopathic sensibility endows him with the power of recognizing extreme degrees of heat

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and cold. Through the third system, called that of deep sensibility, comes a recognition of deep pressure, which may be painful, and of position and passive movement. Epicritic and protopathic sensibility are conveyed to the spinal cord through a system of afferent fibers which run from the skin; deep sensibility by fibers which run with the motor nerves in the muscles and probably have their peripheral end organs located in the tendons and joints (including perhaps the periosteum and bone). Applying these views to the seventh nerve, it follows that the afferent system concerned with deep sensibility, including the pressure and postural senses, might be conveyed brainward in the trunk of the facial, leaving it probably somewhere before it enters the cerebrospinal axis.

In the second place the neural system composed of the geniculate ganglion and its distal and proximal outgrowth is commonly regarded on the basis of the homologies between spinal and cranial ganglia as the sensory portion of the seventh nerve. At the same time all are not agreed as to exactly what are the sensory functions of this afferent system of the seventh.

The questions which present themselves in detail are: (1) Do afferent fibers concerned with deep sensibility (deep pressure and the sense of position and of passive movement) run in the branches and trunk of the motor facial; (2) has cutaneous sensibility, epicritic and protopathic, any general representation in the distribution of the facial; (3) do afferent tracts concerned with common sensibility (epicritic and protopathic) proceed from limited areas in the throat, tongue and ear by way of the geniculate system of the facial to their sensory termini in the oblongata; (4) to what extent are the geniculate ganglion, the chorda tympani, and the great superficial petrosal nerves and the intermediary nerve of Wrisberg to be regarded as concerned in the function of taste?¹

¹ The bibliography appended to the article is not to be regarded as exhaustive, although consultation of the papers enumerated will enable the reader to trace the entire literature of the subject. I have given considerable time to a study of the embryological aspects of the subject, the work of Dixon and of Van Gehuchten having been found especially valuable in this connection.

In the preparation of this paper I have studied the conditions as to sensation in seven cases of section of the root or of the branches of the fifth nerve or of partial or complete extirpation of the gasserian ganglion. Great care was taken in examining these cases first to define accurately the limits of complete and of partial anesthesia, and thus to decide what

PRESSURE SENSE

As already indicated it would seem probable that if deep sensibility is to be relegated to a separate afferent system, the fibers of this system should run with the motor fibers proper, although in a different direction. This would bring the facial, and also the motor trigeminal in harmony with what Head believes to be the case in spinal systems.

Before taking up the pressure sense in connection with the discussion of the functions of the seventh nerve it might be well to say a few words about the manner in which pressure is represented by peripheral end organs. All investigators of this subject are not agreed that the sense of pressure is represented in parts beneath the skin. Some hold that it is in part so represented and in part may be cutaneous. Trotter and Davies, for instance, believe that it is a distinct form of sensation, but in some of its degrees at least, may be recognized by the skin, especially by the deeper cutaneous layers. Head and his collaborators bring light pressure into the same series with light or superficial touch, but they refer pressure sufficient to produce painful response to deep sensibility. Trotter and Davies believe that tactile discrimination, that is, the recognition of two points by the Weber compass test, is dependent upon the sense of pressure, rather than upon the epicritic sensibility of Head. The way of looking at this matter is of some importance in deciding the question of the representation of the pressure sense in the seventh nerve. If light or moderately hard pressure is recognized through the intermediation of cutaneous end organs,

branch or branches of the nerve were fully separated from their centers. The conclusions reached were in all cases based upon the study of cases in which the areas of distribution of either the second or the third or both branches were completely anesthetic.

For the opportunity of investigating these cases I am indebted to several of my colleagues, Drs. Charles H. Frazier, J. C. DaCosta and F. X. Dercum, of Philadelphia, and Dr. Harvey Cushing, of Baltimore. These gentlemen not only placed the cases at my disposal, but gave me valuable assistance in their study. Valuable assistance in examining these patients was given by Dr. Frederick Prime, of the surgical, and Dr. Edward Mercur Williams, of the neurological, staff of the University of Pennsylvania.

In addition to these cases, of trigeminal operation, to obtain data for the paper, I have studied ten cases of peripheral facial paralysis. For the opportunity of studying one of these cases I am indebted to Dr. William G. Spiller; for another to Dr. Charles S. Potts. The rest were observed in private practice or in my services at the hospital of the University of Pennsylvania and the Philadelphia General Hospital.

even if these are situated in the deeper layers of the skin, it is possible that this sense of pressure is represented not in the seventh, but in the fifth nerve, as the latter, as is well known, is the great sensory nerve to the skin, although by it other tissues are also sensorially innervated.

Dana, after division of the third branch of the fifth nerve, found absolute loss of all forms of sensation, including that of deep pressure, in all the parts supplied by this nerve. No anesthesia of the ear or meatus was present. The necessary conclusion on these findings was that sensation, including pressure sensibility, was not conveyed in those branches of the seventh nerve which are distributed to the muscles of the face generally. If conveyed at all by them it was only to the parts of the ear which were not anesthetic. This is of course presuming that the auricle and meatus are not supplied by cervical and other nerves than the fifth or seventh nerves. Dana has also reported a case of complete paralysis of the facial nerve, in which no loss of deep sensation or sense of position could be demonstrated.

Dana carefully describes the methods and precautions used by him in examining for pressure sensibility. He kept one finger inside of the mouth and the other outside, testing for pressure in this way with negative results. When, however, the pressure was exerted so as to affect the bone, the patient appreciated that something was being done to him in that particular place, as he did also when the anesthetic parts were stretched, this result evidently being attributed to the effect produced on neighboring sensitive parts.

Two cases were studied by Ivy and Johnson, both observed in the service of Spiller. In the first of these cases the right fifth nerve was destroyed by a tumor which also involved other parts, but not the seventh nerve. Ivy and Johnson found in this case that sensation of deep pressure was preserved over the fifth nerve areas, as pressure was always recognized by the patient with his eyes closed. In the other case the sensory root of the fifth nerve was cut, the section being complete as demonstrated by subsequent necropsy. In this case the sense of pressure was retained over the area of distribution of the fifth nerve, while that of touch was lost.

Spiller is cited as having observed a third case in which pres-

sure sensibility was retained after destruction of the gasserian ganglion.

The conclusions of Ivy and Johnson were that the fifth nerve conveys fibers of sensibility to light touch, to changes in temperature, and to pain from those parts generally recognized as being within the area of distribution of the said nerve; that the seventh nerve conveys fibers of deep or pressure sensibility from the muscles which it supplies with motor fibers; and that the muscles of mastication, which derive their motor supply from the fifth nerve, probably are also furnished with fibers of deep sensation by this nerve.

In discussing their cases Ivy and Johnson refer to the work of Head, and also to that of Van Gehuchten, Spiller, Donath, Dana, Hunt, von Lenhossek, Retzius and Amabolino, to some of whom references will be made in other connections in the present paper.

In all the cases of trigeminal section investigated by me the pressure sense was studied with results which were practically uniform. In the first place I found it was essential that the condition as to cutaneous sensibility of the so-called epicritic and protopathic types should be very carefully determined. In some of the cases examined for instance, the impairment of sensation in one or more branches of the trigeminus was incomplete. This was the fact even in some cases in which the gasserian ganglion was supposed to have been extirpated, or the sensory root of the fifth cut or torn out. In only one case was the loss of cutaneous sensation in the three branches of the fifth nerve absolute. In several cases sensation was completely abolished in the distribution of the second branch. My conclusions were drawn only from the investigation of completely anesthetic parts.

The methods adopted for testing the sense of pressure were various, as by pressure with the finger, with a pencil, or some other hard object, the use of the ophthalmotonometer and the algometers of Cattell and of Head and Rivers. In two cases in addition the method was adopted of applying steadily increasing weight. With the patient lying down a small card or metal receptacle was placed in the anesthetic area of the cheek and then weights were gradually added, beginning with less than a grain and increasing until a half ounce or more was

reached. During all the pressure examinations the patient was blindfolded or his eyes were closed.

The results obtained by these examinations were practically uniform and indicated that the sense of pressure was represented in the fifth and not in the seventh nerve. In one case when severe pressure was exerted with the algometer over the upper maxilla the patient stated that he thought he felt a point of some kind, but seemed somewhat uncertain about it. The same individual in other examinations could not recognize anything. Whenever the pressure was exerted between the fingers or with one finger in the mouth, using a pressing object on the outside no response could be obtained.

In all the cases of seventh nerve paralysis examined no alteration in the sense of pressure could be determined, although in three cases the patients stated that they felt all forms of stimulus including pressure less upon the paralyzed than upon the other side. These observations I shall presently discuss. The results were probably due to suggestion.

Some of Cushing's observations on the tongue might be interpreted as indicating the presence of a pressure sense in a part supplied by the resected trigeminus, but the conclusion seems doubtful. By the ordinary methods of examination by a hair, pin, compass points, etc., no sensation was evoked, but the patient recognized a swab or some similar object drawn over the tongue. The tongue is an exceedingly mobile and delicately poised organ, and it has seemed to me probable that this response might have been due to movement communicated to sensitive portions of this organ.

My results are not in harmony with those obtained by Ivy and Johnson, and I am not able to explain the significance of the difference in the two sets of cases. Of course in any case of tumor it is possible that some nerve fibers are preserved, but this explanation would not apply to a case of nerve section subsequently verified by autopsy.

POSTURAL SENSE (SENSE OF POSITION AND PASSIVE MOVEMENT)

Is the afferent system concerned with the recognition of position and passive movement represented in the seventh nerve? This is a question which might receive an affirmative reply if the views of Head regarding the third or deep sensibility system are correct. Some consideration must be given to the position

and relations of the seventh nerve musculature in beginning the discussion of this branch of our subject. The postural sense or sense of position and passive movement is both a muscular and arthroidal sense. Whether the latter can be separated from the former in its definition may be regarded as doubtful. The recognition of the position of a limb or a part of a limb is at least largely dependent upon impressions received from joints and the parts immediately controlling arthroidal movements. The face has but one joint under the control of the will, that which is concerned with the movement of the lower jaw, up and down as in opening and closing the mouth, and from side to side as in grinding movements. This movement is affected by muscles supplied by the motor fifth nerve, by the masseters, temporals and pterygoids. Other facial and ocular movements, while of much importance in expression, nasal respiration, articulation, and a few other well-known functions, are probably not to any large degree dependent for their proper performance upon the postural sense—at any rate not to the same extent as joint movements. The postural sense might therefore, it would seem, have a considerable representation in an afferent system passing with the motor fifth, but one much less significant as regards the seventh nerve. Nevertheless it is probable that there is some postural sense connected with facial movements, although this may not be of much importance.

Cushing, Krause and others have observed in cases of section of branches of the trigeminus or of its sensory root, or of extirpation of the gasserian ganglion, appearances and conditions in the face which seem to them to indicate that in some way the cutting of the fifth nerve root or its branches gives rise to some postural deformity. Even Sir Charles Bell as cited by Cushing observed some flattening and other changes in the contours of the face after section of peripheral branches of the fifth. Cushing has made similar and more extensive observations.

“In the period immediately following the neurectomy,” says Cushing, “there may be seen, more marked in some cases than in others, a not inconsiderable hemilateral flaccidity of both upper and lower lips and possibly, as Krause has remarked, a slight flattening of the ala nasi and lessening in depth of the nasolabial fold, a condition somewhat emphasized by the temporary fullness of the tissues due to the vasomotor paralysis. At rest, with the

lips closed, the lip margins on the operated side tend in some cases to remain slightly parted; during active movements the asymmetry between the two sides may become somewhat more pronounced, for example, in the effort to whistle when the lips may be satisfactorily puckered. In one of my cases for a few weeks the postural disturbance was so great as to simulate an actual hemifacial palsy, and only after electrical examination could it be proved otherwise. At a later period the flaccidity is frequently replaced by a corresponding degree of overaction in the expressional musculature, namely, by a slightly drawn position of the corner of the mouth, a deepening of the nasolabial fold, and in old people an accentuation of the wrinkles (crow's foot) radiating from the outer canthus."

Cushing speaks of the possibility of ascertaining the absence or presence of the postural sense in cases of trigeminal section by the use of the faradic current, stating that when the movements are strong enough to produce muscular contractions, these are not appreciated unless the twitchings are conveyed to an esthetic area. The patient also, he believes, does not appreciate passive movements produced in other ways, such as by hooking up the corner of the mouth or the ala of the nose.

In three of the cases of trigeminal section examined by me, I tested the patient in the manner here indicated, that is, both with the faradic current and also by using the finger or a bent aluminum probe as a hook with which to draw up the corner of the mouth or wing of the nose. When the areas investigated were totally anesthetic the patient did not appreciate the movement unless a very strong current was used. In one of the patients the current necessary to produce contraction of the levators of the angle of the mouth and nose and the dilator of the nostril was so strong as to be unendurable in any esthetic area of the face or limb. A minimal contraction was not appreciated, but when the contraction was so strong as to be easily visible to the observer, the patient spoke of feeling a drawing or pulling. I was not able to fully convince myself that this sense of contraction was not a result of extra-polar diffusion of the very strong current to neighboring areas which were esthetic or only partly anesthetic. The contraction or drawing was recognized, for instance, by two patients in whom the area of distribution of the second branch of the fifth was totally anes-

thetic, while the third area was only partially so. Such experiments as I have made are not sufficient to prove that the sense of passive movement was evoked through muscle sense nerves travelling with the motor facial. Cushing's view seems to be that the postural sense as recognized in the face is represented in the trigeminus.

I am inclined to believe with him that much of the postural asymmetry observed in the tongue, soft palate, and face is to be ascribed to section of the motor branch of the fifth, which usually accompanied operations on the sensory root, gasserian ganglion, or branches of the sensory fifth nerve.

Of course some of the postural asymmetry observed, both in peripheral neurectomies and in intracranial operations generally is due to the cutting of muscles and of branches of the facial or ocular nerves, or when these conditions are transient, to pressure on branches of the same nerves.

Little can be determined with regard to the existence in the distribution of the seventh nerve of afferent fibers concerned with the muscle sense by examination of cases of facial paralysis. The patients of course have a feeling of loss or impairment, but it is doubtful whether this is to be classed as a muscle sense impairment or sensation. Owing to the presence of sensation in the skin and mucous membrane a test with the electrical current and by placing the mouth or nostril in different positions can not be applied with any satisfactory results.

It has seemed possible to me that even if the afferent fibers concerned with the sense of pressure and of position and passive movement pass with the motor facial in the periphery, they may on entering the cranium diverge and join the sensory branches of the trigeminus before reaching the gasserian ganglion. It is well known that a considerable number of anastomoses take place between the facial and trigeminus.

EPICRITIC AND PROTOPATHIC SENSIBILITY AND THE FACIAL MUSCULATURE

The evidence of embryology, anatomy, surgery and medicine is conclusive that epicritic and protopathic sensibility (superficial touch, warmth and coolness, tactile discrimination, extremes of heat and cold, and pain) have no general representation in the

facial nerve, and it would be scarcely worth while to consider this question were it not for the fact that occasional cases of facial paralysis are observed in which the patients are apparently slightly hypesthetic not only over the entire face, but sometimes in adjacent portions of the neck and head. In one typical case of facial paralysis studied by me, the patient as the result of numerous examinations uniformly declared that while he felt the lightest touch or prick on all parts of the auricle or behind it, he did not feel these impressions as well as on corresponding parts of the sound side. In two other equally typical cases, the patients in response to the examination said that they could feel better all over the face and on the tongue on the unparalyzed side. In all the other cases of facial paralysis, eight in number, the patients declared that touching, pricking with a needle or pin, pressure with the finger or other object, and various degrees of heat and cold were felt the same on both sides, with but two exceptions. In one of these exceptional cases the patient was slightly hypesthetic on the paralyzed side of the tongue, and in the other tactual stimuli were felt less in a very limited portion of the external auditory meatus. I was confident that in those cases in which there was a widely distributed light hypesthesia this was of a suggested or so-called hysterical character. One of the patients was a Polish Jew, another was a Russian Jewess, and a third was a colored woman, and all were distinctly of a well-marked hysterical or suggestible temperament. The patient who had the very slight and very limited hypesthesia of the external auditory canal was a woman and also, I believe, of this temperament. The man with the hypesthetic half of the tongue was an alcoholic but recently recovered from a prolonged debauch, during which this facial paralysis occurred.

SENSIBILITY OF THE PALATE

By a few observers it has been thought possible that sensibility was furnished to the soft palate or a portion of the soft palate from the facial by way of the geniculate ganglion and the great or small superficial petrosal nerve. Dixon, for instance, states that several observers have recorded cases in which sensibility was retained in the soft palate after section of the fifth nerve trunks. According to him the explanation for this may be

found either in the sensory innervation from the seventh through the great superficial petrosal, or from the glossopharyngeal through the small superficial petrosal, more probably by the latter route. Dixon holds that the small superficial petrosal on embryological ground is certainly to be regarded as an afferent nerve, and no observations are forthcoming which show that the nerve contains taste fibers, and he therefore argues that it may contain fibers concerned with common sensibility. It is true, as he indicates, that in some cases of intracranial operation the soft palate loses its sensibility, but this he would explain not by the cutting of the fifth, but rather by the severance of the small superficial petrosal (a branch of the glossopharyngeal) which is in intimate relation with the dura in the middle cranial fossa.

My own observations appear to show that no part of the soft palate or nasopharynx is supplied with sensation by the seventh nerve. With Dixon I also believe that the great superficial petrosal is one of the primary branches of the geniculate ganglion, and is a nerve of taste, to the soft palate, not a nerve of common sensibility or a motor nerve. Later I shall speak further of the small superficial petrosal.

In the course of my investigations I examined or had examined for me by surgeons and laryngologists more skilful than myself, and usually in my presence, the nose, eustachian opening, soft palate, nasopharynx and fauces for sensibility both in the trigeminal and seventh nerve cases.

Sensibility was retained in all parts of the mouth and throat in all but one of the cases of facial paralysis. This case is deserving of especial detail. Evidently the loss of sensation was not due to any involvement of sensory fibers of the seventh nerve.

The patient was a young woman twenty-four years old, who had had a very severe attack of diphtheria one month before coming under observation. She had been out of the hospital about ten days, and four or five days before she was seen, she noticed stiffness in her face and neck and difficulty in swallowing. She had regurgitation of liquids through the nose when attempting to swallow. She had no pain of any character. She also had a feeling of numbness (rather indefinite and uncertain) in the right side of the face, and was unable to close the right eye or move this side of the face.

Examination showed a typical case of right-sided Bell's palsy,

the upper and lower distributions of the nerve fully involved. Taste was lost in the chorda tympani area of the tongue. Farado-contractility was retained at the time of this first examination. All parts of the ear, face and tongue were tested for light touch, tactile discrimination, heat and cold, but with negative results—sensation was everywhere retained.

Examination by a member of the laryngological staff of the hospital of the University of Pennsylvania of the mouth and throat, including the nasopharynx, the opening of the eustachian tube, investigated by way of the nose, gave the following results: "Sensation was normal on the left or unaffected side; on the affected side sensation was much lessened around the eustachian tube opening. It was normal in the middle of the nasopharynx. The faucial arch was relaxed on the right side and sensation was lessened. The right pillars showed reduced sensation; also the right pharyngeal wall. The muscles of adduction were weak in their action, and during quiet respiration the right side of the larynx was more relaxed than the left."

The impairment and loss of sensation in this case were probably to be attributed to glossopharyngeal and possibly also some vagal or fifth nerve implication.

In the examination of the buccal and pharyngeal cavities in the trigeminal neurectomy cases no special areas of anesthesia or hypesthesia referable to the seventh nerve were found. My own observation regarding the field of anesthesia in cases of sensory root section, gasserian extirpation or section of the second and third branches of the fifth, are practically in accord with those of Cushing as expressed in his admirable paper on the sensory distribution of the fifth cranial nerve. Dr. Cushing, who kindly placed at my disposal two of his cases, examined the tongue, mouth and throat of these patients in my presence with results which correspond to those which are given in his paper.

With regard to the eustachian opening and tube my own observations would seem to indicate that it has in minor part a glosso-pharyngeal sensory supply.

(To be continued)

THE PSYCHO-ANALYTIC METHOD OF TREATMENT¹

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The subject of the present paper is practically a new one to the medical profession of Anglo-Saxon countries.² This fact in itself is worthy of comment, in view of the undoubted value possessed by the method of treatment in question. It cannot be ascribed merely to the restriction of interest in the psycho-neuroses to small circles in these countries, nor yet to conservatism, for it is true not only of England but also of America, which usually shows no backwardness in adopting continental methods. Perhaps one approaches a partial solution when one remembers that Americans, and indeed all people, are readier to adopt a new method of treatment when it is in harmony with previous knowledge on the subject, so that the *rationale* of it is easily understood. It is naturally more difficult to assimilate a new method of treatment when that is based on a totally different conception of the disease from the one to which we have previously been accustomed. That is precisely the case with the psycho-analytic method, for it was evolved by its founder, Professor Freud³ of Vienna, as the result of a profound study which also threw light on radically new aspects of the nature and pathogenesis of the various psycho-neuroses. This fact makes it unavoidable, in discussing the psycho-analytic treatment, to say something about the pathology of the conditions to which it is applied.

To give even an outline of this side of the subject would necessitate far more time than I have at my disposal, and for this

¹ An address delivered before the Niagara District Association, at St. Catherine's, November 24, 1909.

² I have previously given a short account of the aims and principles of Psycho-Analysis (Journ. of Abnormal Psychol., June, 1909, p. 140), and have described two cases investigated by this method (Journ. of Abnormal Psychol., Aug., 1909, p. 218, and Amer. Journ. of Insanity, Oct., 1909, p. 203), as has Dr. A. A. Brill, of New York (Journ. of Abnormal Psychol., Oct., 1908, p. 219, and Amer. Journ. of Insanity, July, 1909, p. 53).

³ A translation of a few of Professor Freud's articles, entitled "Selected Papers on Hysteria and other Psycho-neuroses," has just been completed by Dr. Brill (JOURN. OF NERV. AND MENT. DIS., Monograph Series, No. 4).

reason I feel justified in asking your tolerance if the little I shall say about it appears to you to be over-arbitrary or even dogmatic. It is now known that the symptoms present in the psycho-neuroses are the direct or indirect result of the non-absorption of various mental processes in the main stream of consciousness. Certain desires, wishes, thoughts, occur to the patient, which not only cannot for various reasons be gratified, but which the patient refuses to acknowledge as a true part of his personality. Instead of healthily acknowledging their presence and then dealing with them, by either gratification or control according to the circumstances of the case, he fails to assimilate them, pretends to himself that they are not there, tries to forget them, to submerge or, as it is technically called, to "repress" them (*Verdrängen*). This important process of "repression" may be illustrated by a simple example. Suppose that a young man, dependent on a rich father, falls in love, and that the object of his choice meets with the father's strong disapproval. In his despair the thought may occur to him that were his father to die all would go well, and to his horror he finds himself playing with this thought in his imagination and even for the moment half wishing its consummation, or at all events not being prepared to regret it as conscientiously as he considers he should. A normal man under these circumstances would honestly recognize the existence of the wish in him, though he would of course realize that for pious and ethical reasons it would obviously have to be suppressed; this would probably be an easy matter, for the ethical part of his personality to which the wish is unacceptable would evidently be stronger than the part corresponding to the wish. A neurotic, on the other hand, is more likely to react towards such an occurrence by not owning to himself that he ever had such a wish, even momentarily, and by striving to get away from such an unpleasant thought, to forget or repress it. Not acknowledging the presence of the group of mental processes in question, the subject pays the penalty of being no longer able to direct it. Such a group of mental processes, invested with a strong feeling tone, is technically called a "complex." The complex thus split off from the main body of the personality is now apt to evince an independent activity out of control of the will. This activity is of an automatic kind, and is usually unconscious, and so operates without the patient's being aware of it.

Under certain circumstances, when the repressed desire is so strong that the resulting conflict is intense, the activity of the split-off complex may manifest itself in the form of what we clinically term a symptom. This is especially likely to happen when the desire is in some way or other associated with various complexes that have been split off in early childhood. It is brought about in the following way: The desire, in its efforts to obtrude itself upon the conscious thoughts, meets with an antagonistic force, namely the endeavor of the personality to repress it. It cannot manifest itself in a direct form, but frequently does so in an indirect form which is not recognized by either the subject or the observer. An exact analogy to this process is in everyday life familiar to us all, when an unpleasant truth that cannot be openly expressed is allowed to reach expression if put in a veiled or disguised form. Thus Swift, in *Gulliver's Travels*, and Samuel Butler, in *Erewhon*, managed to say some very bitter things about their generation by the ruse of satirizing some imaginary distant country they pretended to have discovered. Interestingly enough, the mechanisms adopted to evade the social censor are often of precisely the same nature as those made use of in the psycho-neuroses to evade the personal censor. For instance, a sting of self-remorse, which arose in connection with a very real sin that the subject has succeeded in forgetting, may be experienced in connection with some quite venial or even imaginary offence; in other words, his conscience is pretending to make him suffer on account of some unimportant matter, whereas the real source lies hidden and is not mentioned.

Investigation by Freud's methods discloses the fact that every psycho-neurotic symptom is a distorted expression of a repressed wish-complex. The wish itself on account of its unacceptable nature is concealed, and the symptom arises as a compromise between it and the repressing force exerted by the main personality. The distortion in the manifestation of the activity of the repressed complex is often exceedingly involved, and the psychological mechanisms by means of which this is brought about are very intricate. They have been worked out with great accuracy by Freud, and an exact knowledge of them is essential to the use of the psycho-analytic method. In the time at my disposal it would be quite impossible to describe them, though I shall presently try to illustrate one or two of them by the use of examples.

The principle on which the psycho-analytic method of treatment is based has been indicated in the considerations just mentioned, namely that the pathological condition to be dealt with is essentially due to the fact that certain mental complexes have been made unconscious by the mechanism of repression. Now, experience has amply demonstrated that when this process is reversed, in other words when these complexes have again been made conscious and thus fused in the main body of personality, the abnormal manifestation, or symptom, ceases. The central aim of the psycho-analytic method, therefore, consists in enabling the patient to discover and appreciate the significance of the mental process that manifests itself as a symptom. The symptoms constitute a veiled language in which concealed thoughts and desires find the only means allowed them of coming to expression. In retracing the steps along which the pathogenesis of the symptoms has proceeded we get the patient to translate his symptoms into more direct language, and thus to appreciate and understand the nature of them. By so doing we give the patient a deeper insight into the workings of his mind, so that he is enabled to correct abnormal deviations, to overcome internal inhibitions and impediments, and to attain a more objective standpoint towards the repressed complexes the automatic functioning of which has produced the morbid manifestations. He can in this way free his personality from the constraining force of these complexes, and, in taking up an independent attitude towards them, gains a degree of self-control over his aberrant thoughts and wishes that was previously impossible.

We now come to the application of the method in actual practice. This has to be modified from case to case, according to the type of patient and other circumstances, but the following general description is one that has a wide validity. After a short explanation is given to the patient, the first step in the analysis is to orient oneself generally as to the case. For this purpose the following two procedures are well suited. The patient is first asked to relate as fully as possible a history of his life from childhood onwards. Later knowledge always shows this history to be very incomplete, especially in the most important particulars, but it serves to give one a rough notion of the circumstances and conditions of the patient's life, and a general impression of the development of the various stages in his malady. One usually

follows this by applying the word-reaction association method on the lines developed by Jung, for this is of the highest assistance both in giving us a more definite idea of the mental type before us and also in yielding a number of clues to serve as starting-points for later analyses. In this method one or two hundred test-words are called out to the patient, who has to respond with the first word or phrase that comes to his mind. Certain peculiarities in the individual reactions reveal the existence of various complexes or trains of thought possessing a high emotional value, and these can then be followed and more fully investigated. The peculiarities in question are ten or twelve in number. The chief are: undue delay in the reaction-time, failure to respond at all, response by repetition of the test-word, perseveration affecting the succeeding reactions, anomalous clang associations, assimilation of the test-word in an unusual sense, and erroneous reproduction of the reaction when the memory for it is subsequently tested.

One next proceeds to the actual analysis. The material for this consists of what is known in psychology as "free associations," and is obtained by asking the patient to relate in the order of their appearance the various thoughts that spontaneously come to his mind. It is essential for him to do this quite honestly, and fortunately we have several objective tests of his behavior in this respect. As he has to play a purely passive part during this stage, his mind should be in a calm and equable state with all tension so far as possible relaxed. He must suspend his natural tendency to criticise and direct the inflowing thoughts, and here lies one of the greatest difficulties, which must be further considered. The repressing force which has caused the morbid condition present, by driving various memories into the unconscious, constantly exerts itself to keep these memories unconscious, and is now encountered by the physician in the form of what is called personal resistance. The obstinacy with which many patients seem instinctively to cling to their symptoms is generally recognized, though it is often wrongly interpreted as indicating mere wilful perverseness. The patient's resistance may manifest itself in a number of different ways, of which I can here mention only a few of those met with in the course of psychoanalysis. Thus instead of relating his thoughts as they occur to him, in the way he has been told, he will omit many on the

ground that they are apparently irrelevant, unimportant or nonsensical. If a patient relates a thought only after a long struggle with himself, and then excuses himself on the ground that it had nothing to do with the subject or was too unimportant to mention, one can be sure that in reality it is an important link in the chain that we are endeavoring to trace. The patient may omit other thoughts because they are of a painful or unpleasant nature, but here again these are frequently of great import.

During the analysis much valuable information can be obtained by a trained observer from the study of various unconscious actions, slips of the tongue, symptomatic movements, etc., on the part of the patient. These frequently reveal the automatic functioning of some repressed train of thought. The most essential part of the analysis, however, is the investigation of the patient's dreams by means of the special technique introduced by Freud.^{3a} The study of dreams is in this connection of supreme importance, for of all the means at our disposal it is the one that best enables us to penetrate into and understand the most hidden parts of the mind. No one can be competent adequately to use the psycho-analytic method who has not made a thorough study of Freud's *Traumdeutung*, and learned how to apply in practice the principles there laid down. Freud has shown that dreams represent an imaginary realization of various wishes that in daily life have undergone repression. In dreams all our hopes and wishes come true, and it sometimes happens, as Brill has pointed out, that the wish is so strong that later on the dream itself is made to come true, an event which is an interesting source of superstition. In most cases the gratification of the wish is so distorted in the dream that the subject is quite unaware of the significance of it. One can in many respects draw a close analogy between dreams and psycho-neurotic symptoms. They both represent the unconscious gratification of wishes that from their unacceptable nature have been repressed by the patient, both are distorted and unrecognizable manifestations of wishes that are struggling to find expression in an indirect form, with both the psychological mechanisms by which is brought about the distortion that allows them to evade the censor are often identical, and in both cases the actual wishes are frequently of precisely the same nature. The interpretation of a dream by psycho-analysis

^{3a} See a paper on this subject in the *American Journal of Psychology*, April, 1910.

thus often gives the clue to the solution of a given set of symptoms, as Freud has cleverly shown in his *Bruchstück einer Hysterie-Analyse*.⁴

We may now shortly consider a few illustrative examples.⁵ A common form of compulsion neurosis (*Zwangsnurose*) is that in which the patient has an almost continuous impulsion to wash his hands. With this may be the obsession that the hands are soiled, contaminated or even infected, or the phobia that the hands may get contaminated or infected (one form of nosophobia). The morbid desire for cleanliness, called by the Germans the *Reinigungsneurose*, may extend so as to involve the whole body, or, in the case of women, the house as well, a not infrequent source of domestic discomfort. This symptom produces a lively impression of meaninglessness or even of foolishness, and is certainly hard to understand until one begins to analyse the nature and origin of it. A direct clue to the significance of it, as to that of many other neurotic symptoms, was given three hundred years ago by Shakspeare. He describes how Lady Macbeth has the "accustomed action" of rubbing her hands together, as if washing them, for a quarter of an hour at a time, and, appropriately enough, the patient furnishes the key to the riddle by disclosing her secret thoughts in her sleep. "What, will these hands ne'er be clean? . . . Here's the smell of the blood still: all the perfumes of Arabia will not sweeten this little hand." This is a beautiful instance of how a symptom may come about through the subject gratifying a wish connected with one subject, which is unpleasant, by transferring it to an indifferent one. Lady Macbeth imagines that she is washing away a stain from her conscience, whereas really she is only washing away a fictitious one from her hands. Shakspeare completes the picture by making the doctor say, "This disease is beyond my practice," and until the epoch-making work of Freud fifteen years ago no doctor could but agree to the remark. The example in question also well illustrates a common objection raised to the explanations that psycho-analysis gives to many symptoms, namely that they seem so illogical. This is true, but it must be remembered that the mental processes that go to form such symptoms are themselves illogical. The mental processes of early childhood, of savages, and of the unconscious

⁴ Sammlung kleiner Schriften, 2e Folge, 1909.

⁵ The cases described are not reproduced here, as it is intended to publish them later in detail.

activities of civilized adults are of a low order, and do not follow the same rules of logic as do the waking conscious processes that we are accustomed to. It might be said of the present example: how could anyone confound a concrete object such as a hand with an immaterial object such as a conscience? The two objects, however, have in common this important attribute, that both can receive stains which can be washed away, and to a person in whom the desire to wash away stains has attained a raging intensity all objects to which the desire can be applied seem of a kind. They are classed together, and unconsciously are often confounded with each other, or even fused in one. One might say that to such a person it becomes irrelevant *what* is washed clean of its stain so long as *something* is. It is the same in any acute emergency of life, when the desire to act in some way or other is so strong that the wildest, most illogical deeds are performed in order to satisfy that desire.

The mechanism above referred to is technically known as the transposition to one idea of the affect originally belonging to another. Perhaps as common is another mechanism in which transformation of the affect takes place into its opposite. Desire is particularly often in this way transformed into fear. The maiden who just before retiring looks under the bed to see if there is a man there very often most dreads what she most dreams of, and many phobias are similarly constituted, though rarely in so simple a manner.

It sometimes happens that a symptom, which has been removed by psycho-analysis, later returns. The explanation of this is as follows. When once a symptom has been created as the mode of outlet for a repressed wish there is a great tendency for other, but allied, wishes to realise themselves in the same symptom. It is just like the rain streams on a hillside which tend to make use of old channels, if only these are near enough, rather than to cut independent ones. In general it may be said that the greater is the duration of a given symptom the more likely is it that it subserves the function of gratifying more than one repressed mental train. Freud calls this occurrence the over-determining (*Überdeterminierung*) of a symptom. Then the symptom may recur until we have dealt with all the underlying complexes. When this has been done the symptom will not recur. Further, a given repressed complex may be a factor in the causation of more than one symptom. This greatly complicates the

analysis, but it is so usual that one may fairly describe the underlying pathogenic factors in an average case as constituting a continuously intertwined, and often very entangled, network. One compensation for the labor that the unravelling of this state of affairs involves is the fact that solution of one group of complexes sometimes agreeably rids the patient of more than one symptom, and in any case it frequently gives a useful clue to the mechanism of other symptoms than the one with which it is most nearly connected.

As to the nature of the pathogenic factors two general remarks may be made, namely that the complexes usually arise in infantile life, and that they are most often of a sexual character. These two remarks may seem rather to contradict each other, but that the sexual life of early childhood is far richer and more complex than is generally supposed is one of the matters that Freud has most illuminatingly demonstrated.⁶ It would be difficult to overestimate the importance that the mental life of early childhood possesses for the determination of the future trends of the individual. Impressions and modes of reaction that seem to the adult trivial enough are often of the greatest significance in forming the basis for much of later development. As regards the psycho-sexual processes it must be remembered that these constitute the most intimate, private and hidden part of the personality—in fact we may say the very core—and further that they are the ones most injured, repressed and distorted under the pressure of educative influences. It is little wonder then that they so frequently lie at the root of psycho-neurotic disturbances.

Something should now be said about the clinical applicabilities and limitations of the method. The conditions that lend themselves to psycho-analytic treatment comprise practically all forms of what are commonly grouped under the name functional neuroses, hysteria, neurasthenia, obsessions, etc. Some of these conditions yield more readily to treatment than others, but it would be impossible to consider this point in detail without taking up the vexed question of classification and nomenclature. The demands made on the patient are considerable, for the result of the treatment greatly depends on his sincerity and perseverance. Further, little can be done with unintelligent patients, or with those who are brought against their will to be treated. Again, age is a ser-

⁶ See "Drei Abhandlungen zur Sexual-theorie," 1905. I have tried to expound a part of this subject in a recent article published in the *Amer. Journ. of Psychol.*, Jan., 1910.

ious obstacle; after the age of fifty the plasticity of the mind is so frequently diminished, and the amount of material to be worked through is so great, that in most cases to undertake a psycho-analysis is impracticable. The most weighty drawback to the treatment, however, is the amount of time it consumes. Severe cases may exact daily treatment for several months or even longer, though useful results are frequently to be obtained in less time than this. In passing judgment on this question of the duration of the treatment one should bear in mind several considerations. In the first place that it should be impossible to carry out in a short time such a huge task as psycho-analysis often proves to be is surely comprehensible when one remembers that in all cases the roots of the trouble go back to early childhood, so that the material obtained representing the interwoven distortions of the succeeding years is often immense. The pace at which the analysis proceeds cannot be forced, any more than the inoculation treatment of tuberculosis can be hastened by increasing the dose of the tuberculin injected. The treatment is rarely a quite continuous one, for it often has to be interrupted by acute exacerbations of urgent symptoms, or by purely external circumstances over which the physician has no control. Again, although a long time may elapse before cure is effected, still relief of various symptoms can frequently be brought about at an early stage in the treatment, and during the whole procedure the patient is usually in a far better condition than he has previously been. The final answer, however, to any objection raised on the ground of the time taken is that equal results cannot be achieved by any shorter method, so that here, as in many other spheres, the Irishism holds that "the longest way round is the shortest cut home." In the American medical press several other objections have been raised to the treatment, but in such an irresponsible way that I shall not waste your time by discussing them. I can only say that I have yet to hear of a serious objection that would not immediately answer itself by being put to the test of a little first-hand experience.

The amount of time demanded by the treatment, as well as other considerations, prevent it from being of very wide applicability in general practice. The using of it, like that of all special methods of treatment, involves the acquirement of a special technique, and perhaps of some capacities that every physician does not possess. Exactly the same remarks may be made about the

surgical treatment of brain tumors or of gallstones, as well as of many other therapeutic measures, but this fact would surely lead no one to deny that such special methods of treatment have their legitimate place. The conclusion that, wherever possible, operation is the best treatment for a tumor of the brain is in no way invalidated by the fact that not every practitioner can carry out this treatment. I would maintain that every advance in treatment, of however special a kind, has its interest for the practising physician. Especially is this so in the case of psycho-analysis, for in the first place the conclusions reached by this mode of study and the knowledge gained as to the nature and causation of the psycho-neurosis should be of the greatest practical value in enabling the profession to attain a more accurate point of view concerning them and of dealing prophylactically with the causative factors, and in the second place our capacity to relieve these conditions is at present notoriously unsatisfactory.

The results obtained by the treatment are unquestionably very gratifying. They surpass those obtained by simpler methods in two chief respects, namely in permanence and in the prophylactic value they have for the future. Everyone who has carefully observed such cases knows that, though the symptoms may in various ways be temporarily removed, the tendency to recurrence of the same symptoms and to the appearance of fresh ones is very great. It is only when the actual morbid agents are dealt with that the cure becomes permanent. No better criticism could be offered of past methods of treating the psycho-neuroses than by merely recalling the undeniable fact that they may all fail in cases which yield to the successful efforts of any of the numerous varieties of charlatanry that prey on society in general and the medical profession in particular. Psycho-analysis, by giving the patient control over the disharmonies of his mind, leads him to develop a greater measure of self-reliance and independence. The training he receives is thus an educative one in the highest sense of the word, for he not only achieves a richer development of will-power and self-mastery, but acquires an understanding of his own mind which is of incalculable value for future prophylaxis. It is a matter of congratulation for the patients, for society, and for ourselves that we at last have in our hands a precise and formidable weapon to deal with the very maladies that up till now have been the despair of the profession and the triumph of the quack.

Society Proceedings

THE PHILADELPHIA NEUROLOGICAL SOCIETY

JOINT MEETING WITH THE NEW YORK NEUROLOGICAL SOCIETY

December 18, 1909

The President, Dr. T. H. WEISENBURG, in the Chair

Dr. Charles S. Potts presented a case of tic of the tongue.

Dr. John K. Mitchell presented a case of amyotrophic lateral sclerosis or lead poisoning.

Dr. B. Sachs, New York, said there were two things that struck him about the case. There could not be any question about the central nervous system involvement. The appearance of the tongue alone would necessarily place it among the category of cases that involve the bulb, and as such there would be very little difficulty in acceding to the diagnosis that it is an amyotrophic lateral sclerosis. The reflexes are present without being very much exaggerated and he has often felt, in the case of amyotrophic lateral sclerosis the same as in spastic paraplegia, there is a balance to be established in the two diseases; in this case there is a balance established between the amount of involvement of the gray matter and of the white fiber tracts. In the case of amyotrophic lateral sclerosis there is much more involvement of the gray matter than of the white matter. In this case there is also another possibility, and it seemed to Dr. Sachs we might take this into consideration, that it could very well be a combination of two things; that is an involvement of the peripheral nervous system as the result of lead intoxication. Dr. Sachs said that there could be no doubt that there was an organic central nervous disease present in the case exhibited.

Dr. M. Allen Starr, New York, agreed with Dr. Sachs in feeling that in this case we have the evidence of a lesion of the central nervous system, and he was much more inclined to the diagnosis of an amyotrophic lateral sclerosis with bulbar palsy than to a lead neuritis or to a lead poisoning. He thought that while we must admit that in the majority of cases of lead poisoning the effect of the lead is marked upon the peripheral nerves, the effect of lead poisoning is also shown by changes in the central nervous system. There are many cases on record of autopsies following lead poisoning—notably those reported by Schultze in the *Archiv für Psychiatrie*—in which marked lesions of the anterior horn cells were found in connection with the lead palsy. In three severe cases of lead palsy under the care of Dr. Starr, involving both arms and legs, confining the individuals to bed and putting them in a greater invalid state than the man exhibited by Dr. Mitchell, there were also marked cerebral symptoms and in two cases severe headaches and in one very marked obscuration of mental action. It seemed to Dr. Starr that were the degree of toxic

effect in this case sufficient to cause all the symptoms shown we should also have the other symptoms of lead encephalopathy and the direct effect upon the brain as well as upon the spinal cord.

Dr. D. J. McCarthy presented a case presenting the symptomatology of paramyoclonus multiplex.

Dr. J. Ramsay Hunt, New York, agreed with Dr. McCarthy that the symptoms indicated a cerebral lesion. But he was not inclined to call it even a symptomatic paramyoclonus multiplex. The paramyoclonus of Friedreich is a disease in which muscles are represented and not movements. In other words, it is referable rather to the cellular group of the spinal cord than those of the Rolandic area. Of the true paramyoclonus multiplex he has seen only two cases, one in Europe and one a case he recorded with histological study of the central nervous system. In these cases the patients showed, while at rest, absolutely no evidence of muscle involvement. There were none of the locomotor effects we observe in this patient. As soon as the skin was exposed, however, the muscles were seen to be jumping and vibrating in all directions, and quite independently of one another. Dr. Hunt was more inclined to regard this case as belonging to the congenital athetoid movements or tremors.

Dr. Morton Prince said it was very difficult to criticize a diagnosis in view of the small opportunity afforded for examining a case of the kind Dr. McCarthy presented, but he confessed his conception of paramyoclonus multiplex was something different from the case exhibited. He always had the concept of paramyoclonus as involving the muscles rather than movements. Dr. Prince thought the disease very rare and he illustrated this by a case he saw once which seemed to him to be a typical case of paramyoclonus, as he understood it. It was a case of traumatic neurosis following an accident and there was in this case rhythmical contractions of the rectus femoris about one nineteenth of a minute and these rhythmical contractions continued night and day during sleep and while awake. There was also some involvement of the gluteal. An interesting point in that case is that it bore out one theory of paramyoclonus, that is, it is a functional disease. The disease was apparently cured, at any rate the movements entirely ceased after manipulation which would not seem possible to have any influence. The attending physician thinking he would do something—these spasms had lasted 49 days—without knowing what he would do, stretched the sciatic by the old method of doubling up the legs on the body and almost immediately after that these movements ceased entirely. Dr. Prince hardly believed the stretching had anything to do with it, but at any rate the movements ceased. In Dr. McCarthy's case there is a flexion and extension of wrist, involving both the radial and ulnar groups of muscles on each side, extending up the arm around the shoulder so that it would seem that here we have mere movements. Dr. Prince thought that the more one reads about these things the more he gets confused. It was suggestive to him of some congenital disease, possibly cortical. The weakness in the right arm, especially, was pretty well diffused over the right arm.

Dr. L. Pierce Clark, New York, said that his experience in this chronic convulsive disorder had been mainly confined to myoclonus epilepsy. He had reported some eight cases of the latter affection. The type of spasm in Dr. McCarthy's case was quite similar to that which he had observed in his cases. The point which seemed to prove to him

that the case under discussion was but a myoclonic symptom here, and not a disease per se, was that the myoclonus remained distinctly hemiplegic and the movement in the arm was as keenly in evidence distally as proximally. That the symptom here shown was dependent upon a more or less definite brain lesion was significant and was a further link in the chain pointing to a cortical brain lesion as the true origin of myoclonic spasms, a contention which he had long held. Dr. Clark thought that the more one saw of the myoclonic movements, existing either as a symptom complex, set in a picture with other associated motor disorders, or a disease entirely alone, the more one was inclined to agree with Oppenheim and others that a separate and distinct classification was alike unnecessary and impossible. They ought to be classed simply in one large group of *myoclonias*. There were certainly all possible variations in the spasms in the same case at different times in the course of the disease. Certainly the so-called Friedreich's type had no right to a separate and distinct classification because of the so-called pathognomonic fibrillary tremor in the muscles diseased, as all the speaker's cases of myoclonus epilepsy had shown this phenomenon as well as myoclonic spasm of whole muscles sufficient to produce locomotor effect.

Dr. McCarthy, in closing, said that the reason that the title was given as it was, was because he did not consider the case one of paramyoclonus multiplex. It was rather hard to present a title for the condition. The mere fact that the condition was congenital, whereas Friedreich's type was acquired, together with the type of symptomatic manifestation, practically excluded a case of paramyoclonus multiplex. In the symptomatology in this case, when the patient is not under such excitement as he was to-night, he presents less of the actual movement of the arm and more of the fibrillary type of tremor. Dr. McCarthy had considered the case to be, as Dr. Hunt stated, a condition related to the athetoid movements and due to the organic conditions of the brain seen in the cerebral palsies of childhood. The question Dr. McCarthy wished to decide was whether it would be better for a man working as a laborer to have athetoid or myoclonic movements, or to have the posterior spinal roots cut and have at the same time loss of sensation. And further, whether an operation on the spinal roots would lead to a cessation or amelioration of the movements.

Dr. F. X. Dercum presented two patients exhibiting (1) athetosis and astereognosis of sudden onset. (2) Athetosis and astereognosis of gradual onset, associated with signs of multiple lesions.

Dr. Smith Ely Jelliffe of New York, said that, recognizing that the time was limited for the presentation of patients, there were certain necessary details that Dr. Dercum had not covered, but from what he had said, and a brief examination could show it to him, it seemed that the first case might be one of Dejerine's thalamic syndrome. In this syndrome as is well-known there is (1) persisting hemianesthesia, particularly for deep sensibility, muscle and position senses, less so for tactile pain or thermal sense, (2) slight fugacious hemiplegia, (3) hemiathetoid or choreic movements, (4) astereognosis and (5) severe persisting pain. Barring the lack of pain and a fragmentary record of the exact status of the bony sensibility, Dr. Jelliffe thought it probably an atypical thalamic syndrome, but it might be supracapsular, and due to a lesion of the sensory cortical areas, similar to the cases reported by Henschen, Müller, Dejerine and most recently by v. Stauffenberg.

With reference to the second, much more complicated case, the history was incomplete and even contradictory and he could form no opinion.

Dr. Morton Prince said he had intended to point out what Dr. Jelliffe had already said. In the first case its similarity to the thalamic syndrome, but the patient states unquestionably he has tingling in the left hand. Dr. Prince thought it was interesting, also, in that case to point out that the marked disproportion of the loss of the sense of position, muscular sense and sense of localization exists in that hand out of proportion to the loss of tactile sense. He thought that was very important. He emphasized the point that in trying to determine whether astereognosis has a function that we should be very careful to test all these various forms of sensibility. While the tactile sense may be present, yet there may be marked loss of localization. His tactile sense is only moderately affected and there is a very marked loss of sensation. He has possibly pain, possibly very slight hemiplegia and the other symptoms Dr. Dercum spoke of, they are suggestive of the thalamic syndrome.

The second case is also suggestive, especially the athetosis combined with it. There is very marked loss of localization and loss of position of the hand out of proportion to the tactile sense.

Dr. William G. Spiller and Dr. Charles H. Frazier read a paper upon the treatment of spasticity by resection of posterior spinal roots, and presented a case operated upon in September.¹

Dr. L. Pierce Clark, New York, stated that Dr. Alfred S. Taylor and himself had undertaken this type of operation for the past few months, since August 23, 1909, the date of their first operation upon a case of cerebral diplegia with marked spasticity. Two other operations of this character had since been undertaken, all with gratifying results in overcoming the spastic state. They had shown the first case and presented a preliminary communication upon the subject before the New York Neurological Society, October, 1909. They had also presented all three cases and a paper upon the clinical and surgical aspects of this operation at the November 11, 1909, meeting of the Pediatric Section of the New York Academy of Medicine. Their work had been undertaken independently of Förster and Teitz's, of Breslau, published some two years ago. Dr. Clark did not doubt but that theoretical suggestions of the addition of sensory disease by surgical means had been made several years ago by several investigators. He knew Förster had written upon the subject, and Fraenkel, of New York, in the Medical Record, December 12, 1903, had said in the course of a paper upon "Muscle Tonus and Tendon Phenomenon" that "disease of the pyramidal tracts causes hypertonia and increase of reflexes. The tendon jerks under such conditions are increased unless additional disease of the ascending tracts, anterior horns or some part of the peripheral neurone neutralizes this influence." In discussing Dr. Clark's paper before the Pediatric Section in November, Dr. Fraenkel said for many years he had hesitated to take the practical steps to carry out his theoretical suggestions, because there was a deterrent uncertainty as to the outcome and the difficulty in finding a quantitative gauge in the amount of sensory disease to be added surgically. At Dr. Fraenkel's suggestion Dr. Beer gave an intraspinal injection of stovaine in a severe case of spastic diplegia at the Montefiore

¹ University of Pennsylvania Medical Bulletin, Jan., 1910.

Home. In five minutes Babinski's sign disappeared, ankle clonus soon after disappeared and the patient was able to get up and walk about the ward for some forty minutes, a thing not possible before. As the stovaine influence wore off, the diplegic returned to his former helpless spastic state. He hoped for the glory of American neurology that the specific suggestion for dorsal root section as a cure for spasticity had been first made by Dr. Spiller as stated in the paper of the evening. The speaker was glad to note the betterment in Dr. Spiller and Dr. Frazier's case, and it gave further evidence to the effectiveness of this operation. Cases ought, however, to be selected with the greatest care. The operation would be of less use in those spastic cases of pyramidal lesions where collateral sensory tract involvement was already present, however slight, and in those cases where paresis and wasting were extreme.

The first case of the speaker's, operated upon by Dr. Taylor, was a typical spastic diplegic with the scissors gait. He could take steps of only a few inches in length before treatment; after operation he walked with a wide, straddling gait two feet in length. Dorsal roots from the twelfth dorsal to the fifth lumbar inclusive on the left side were resected. Some spastic element still remains in the left leg. Further resection on the right side will also be made. In operating upon the cerebral diplegics, one must bear in mind that the whole spinal system is involved in the spastic states; trunk movements in ordinary walking in such cases need thorough surgical attention and after-training. Case two was one of severe spastic hemiplegia and the arm alone was operated upon; dorsal roots of the fourth cervical to the second dorsal inclusive were resected. There was no loss of the reflexes following operation. There was anesthesia in the seventh and eighth cervical and first dorsal skin segments on the arm. Spasticity was entirely relieved. The third case was one of hemiplegic epilepsy following infantile cerebral palsy dating from birth. There was also athetosis in the shoulder. Dorsal roots from the fourth cervical to the seventh inclusive were resected. The result after operation was no spasticity, loss of previous athetosis and marked diminution of epileptic fits. There was still present an active reflex in the biceps and no detectable loss of sensibility. The operations were done with remarkable celerity (not more than thirty minutes) and with ease by Dr. Taylor's unique method of unilateral laminectomy. All the operations were excellently borne. Orthopedic after-care and training were most important.

Dr. Charles H. Frazier, Philadelphia, read a paper on division of the auditory nerve for persistent tinnitus.

Dr. M. Allen Starr, New York, presented photographs of a case of facial hemiatrophy in a child eight years of age. The youngest case on record is sixteen years old. The disease is very rare in childhood.

Dr. Charles K. Mills presented a paper on the clinical study of changes in sensibility due to organic and functional disease, especially with reference to the methods of testing.

Dr. M. Allen Starr, New York, said he wished to express his thanks to Dr. Mills for the presentation of so many interesting facts in regard to methods of sensory investigation. There is no doubt that very careful observation of this kind, very careful investigation of every case along sensory lines is not only of academic interest, but may be of very great practical importance in determining the localization of various lesions. Certainly these articles are of great interest to us scientifically and Dr.

Starr said he was sure all were very much gratified by the care Dr. Mills had shown in bringing them before the societies.

Dr. Smith Ely Jelliffe said that the investigation of the sensory symptoms in nervous disorders had only just begun. Dr. Mills was to be congratulated on bringing the subject so forcibly and reasonably before the societies. But not only were the tests for sensory disturbance as outlined by Head and Sherren, by Trotter and Davies, by Franz and others necessary, but there remained a large number of sensory receptors to be studied that had not yet been attempted. This was particularly true for the chemical receptors of the stomach, the intestines and others brought into prominence by Sherrington in his far-reaching generalization of the proprioceptive system. Neurologists are only just waking up to the possibilities and psychiatrists have neglected an important field. Fortunately through the work of Franz, at the Government Hospital, the sensory disturbances in the psychoses were receiving attention. The dementia præcox group promises important results. Dr. Jelliffe would further call attention to the work of Stern and his school on the careful test methods they were devising for objective correction of these purely subjective matters; especially in affording quantitative estimations for malingering, exaggeration and aggravation.

With reference to the variations that Dr. Mills had found from the work of Head and confirming that of Trotter and Davies, Dr. Jelliffe called attention to Franz's excellent study in the *Journal of Comparative Neurology* of this year (1909) where similar results had been indicated.

Dr. Morton Prince said he believed the Society was very much indebted to Dr. Mills for what is essentially a very timely paper, the work of examining sensibility is so time-consuming that we all rather shrink from it, but now that Dr. Mills has led the way he thought it would have a very much more stimulating effect in inducing others to follow up the work.

Regarding the method of having the patient test himself Dr. Prince said he had often used it on patients and found it very satisfactory, though he had never used it for systematic investigation. The point is whether in the differentiation of the points of the compass, there is a special form of perception or whether it is not simply a different form of localization. It is of importance if it is only a form of localization, then there are other tests which will be more accurate. Head seems to give it a special sensibility and gives it a special path in the posterior columns of the cord as if it were a special form of sensibility. Spearman, who has approached the subject from the psychological point, regards it simply as a different form of spot localization and not anything special in itself. What is the proper interpretation Dr. Prince said he did not know, though he was inclined to regard it simply as a form of localization. If we are going to make the test we should determine what this compass differentiation is.

Dr. Mills in closing spoke as follows:

With regard to the results of his investigations he could have said much more if time had permitted. Some of these results will be published in the paper when it appears in its entirety, but even this contribution he regards as simply a preliminary paper. In his investigations up to the present he had been largely engaged in trying out methods and in determining lines of clinical research which could best follow with the material more or less continuously at his disposal. With these methods

carefully determined by experiment and with new appliances, he hoped, with the assistance of members of his university neurological staff, to obtain additional results of value during the next year or two.

With regard to the discrimination of two points he would say, in answer to Dr. Prince, that he did not believe that tactile discrimination belonged entirely in the domain of superficial touch, in the epicritic system where Head was inclined to place it. Tactile discrimination he believes, with Trotter and Davies, was in large part at least, a pressure sense phenomenon. If this be the case the spinal and higher pathways for this form of sensibility were in all probability separate, as had been suggested and as observations of his own have indicated. In the spinal cord this path for tactile discrimination was most likely, like that for muscular sensibility, to lie in the cord on the side of entrance until the transition region between the cord and oblongata was reached. It was probably distinct from the path for the transmission of impulses concerned with the sense of position and passive movements, although following, in a general way, the course of this path or tract. He had something to say in his paper and would have something additional to offer in the future as to the difficulty of absolutely discriminating after the manner of Head, between epicritic and protopathic sensibility, and between the latter and deep sensibility. Sensibility to heat and cold, that is to differences in temperature, always involves temperature discrimination until the degree of warmth or coolness was very near to that of the skin. The fact that pain could be elicited on deep pressure when the cutaneous sensibility, epicritic and protopathic, was entirely lost would appear to show that an absolutely sharp distinction could not be drawn between protopathic and deep sensibility. The pain evoked was pain in the strict sense of the word, not in a new sense; it was, in other words, protopathic. End organs and fiber systems therefore similar to those in the skin probably existed in deep tissues like tendons, periosteum and bone. The peripheral afferent tracts for such a protopathic system might travel in the motor nerves, side by side with the afferent fibers for the sense of position and other forms of deep sensibility, but before entering the cord probably separated to proceed with other fibers of the cutaneous protopathic system to their proper spinal receptors.

With regard to the use of the finger tip or stroking method in the study of hysterical anesthesia and hypesthesia, he would repeat that much of interest and something of value could be brought out by this method. Close attention should be paid to the areas resulting from the first test thus made. It was preferable to have the patient blindfolded, although Trotter and Davies did not require this in their nerve investigations. The hysterical patient will mark out with great accuracy, and without leading, a line of hemianesthesia or hemi-hypesthesia, and if this line recedes on one part of the body, as on the face, it recedes to about the same distance on any other part, as on the trunk. The recession is not an evidence of stimulation or demi-simulation, as some might imagine, but rather of the degree of the receding involvement of the central nervous structures which are concerned with the production of such peripheral sensory phenomena.

NEW YORK NEUROLOGICAL SOCIETY

January 4, 1910

The President, DR. J. RAMSAY HUNT, in the Chair.

RETROBULBAR OPTIC NEURITIS FAMILIARIS: TWO CASES

By H. Climenko, M.D.

The patients, who came to the New York Neurological Institute in the service of Dr. Joseph Collins, were two brothers, clerks by occupation, aged, respectively, 24 and 27 years. In the first case the loss of sight had been gradual, dating back over a period of nine years. The patient had complained of dizziness at the onset of his disease, but this had disappeared after a few weeks. There was no history of headaches or vomiting. Both eyes were equally affected. In the second case, the disease dates back five years. The right eye was first affected, followed in the course of a few months by similar symptoms on the opposite side. This patient gave a history of temporal headaches; no vomiting.

The personal and family histories, as far as they could be ascertained, were negative. The ophthalmological findings were as follows: In the first case: Vision—counts fingers in the lower and outer periphery of the field; only movements of hand in the other portions of field, slight nystagmus-like motions in extreme directions of gaze. Right optic disc whitish, pallor more marked on temporal side. Left optic disc same condition.

In the second case: Vision—movements of hand in each eye seen only in the extreme periphery of field. Slight nystagmus-like switching in extreme lateral directions of the gaze. Optic disc, in right eye, is bluish white, pallor more marked on temporal side. Left eye shows same condition. No other somatic symptoms were revealed under several examinations.

The mentality in both cases was not impaired. In very rare cases insular sclerosis begins in a similar manner. If, however, we take in consideration the length of time and the absence of any of the characteristic symptoms of insular sclerosis in each case and the fact that the patients are brothers, we are bound to conclude that the above syndrome corresponds closely to what is known as neuritis optico-retrobulbaris familiaris, and described in 1873 by Dr. Leber.

A CASE OF HUNTINGTON'S DISEASE

By David E. Hoag, M.D.

The patient was a man, 30 years old, who was born in New York, of Austrian parentage. His father, who was born near Vienna 85 years ago, came to this country when a young man and settled in Buffalo, and at the age of 36 he married a woman much his junior, whose maiden name was Sohn. Eight children were born as the result of this union. According to the history obtained from the children, disease can be

traced back to paternal grandfather,¹ the father, also, for ten years prior to his death, suffered from symptoms similar to those observed in this patient, and for a few years prior to his death he was completely paralyzed. A sister of father also died with this disease five years ago. One brother of this patient committed suicide four years ago. He suffered similar symptoms to father and became very despondent, fearing the possible result of disease, and it was for that reason that he took his life. Still another brother who died four months ago had similar symptoms for eight years prior to his death: for a year or more he was absolutely helpless, so that he could not feed nor take care of himself, with a mental condition bordering on dementia. That brother was shown at a meeting of this Society by Dr. Edward D. Fisher on May 1, 1906, and at the same time he referred to a younger brother (the patient shown to-night), who was then beginning to show symptoms suspicious of this disease.

The present patient, Dr. Hoag said, had had a remarkably clean bill of health up to three or four years ago, and he had been particularly exempt from the diseases of childhood. There was no history of rheumatism or chorea, although these diseases are not looked for as a forerunner. In his general behavior he was kind and considerate, and showed good judgment both in his home and business life, and was absolutely free from bad habits. In 1902 he enlisted in the regular army and was sent to Cuba. Towards the completion of his three years of service he first noticed a slight unsteadiness in his gait. In spite of this he completed his term of service, and after a few months of civil life he reenlisted, so that evidently his symptoms at that time were not sufficiently pronounced to attract the attention of the examining surgeon. In the course of the next year the unsteadiness in his gait became more severe, and he first noticed twitching of the arms and hands. He also began to lose strength, and appeared anemic. He began to show awkwardness at drill, his aim became bad and he was finally pronounced unfit for service and honorably discharged. He remained at home for a time and then was admitted to the Soldiers' Home at Washington, D. C., of which he was still an inmate. He has improved very much since, probably due to enforced rest. The general unsteadiness of the legs and twitching of the arms had remained about stationary. Although finer movements may trouble him to execute, he had no trouble with coarser ones, could write fairly, and even play billiards. Symptoms were not obtrusive, and when patient's attention was not directed to himself, the casual observer might overlook conditions. His mental condition was good. His speech was peculiar, with the characteristics, at times, of a spasmodic drawl. During sleep he was exceedingly restless, oftentimes finding himself entirely reversed in bed in the morning. There was a slight tremor of the outstretched hands, and the patellar reflexes were exaggerated, also had an unsustained ankle-clonus. Pupils were normal. In testing muscular strength, by forced flexion of arms or legs, or by testing the hand grasp, a rigid resistance was immediately followed by complete relaxation, then rapidly again a tightening, this occurring momentarily during test. He was very excitable, and at athletic events of which he is passionately fond, expressed his displeasure or approbation by shouting and violent gesticulations. His sexual instinct was very strong. He was fully cognizant of the gravity of his

¹ This additional information was obtained subsequent to presentation of case.

disease, but was very optimistic regarding outcome, basing his hope upon his freedom from worry and work at the Soldiers' Home.

Dr. Smith Ely Jelliffe said that according to this patient's history, the disease had its onset at the age of 26 or 27, which was unusually early. Although Huntington's chorea could not be ruled out at such an early age, it was extremely rare, whereas myoclonia of the family type as described by Unverricht and Lundborg, and not necessarily related to epilepsy, from which condition this type of case must be differentiated, was not at all uncommon in the younger years. The movements of this patient, as observed at present, while those of Huntington's chorea could not be regarded as an absolute feature in the diagnosis between these two disorders; the strong family history made it seem improbable that myoclonia should be entertained, but there are undoubtedly chronic choreic-like affections, not Huntington's chorea, which are hereditary, which must always be borne in mind in studying these cases. Lundborg's masterly studies should be remembered in this connection.

Dr. Edward D. Fisher said that at a meeting of this Society three or four years ago he had presented a brother of this patient. The case shown at that time was a well-defined one of Huntington's chorea, and not at all suggestive of paramyoclonus multiplex. The symptoms in that case progressed rapidly up to the time of the patient's death. With that case in mind, and with the history of the father and still another brother before us, the speaker thought we could fairly regard this as a case of Huntington's chorea, although the symptoms had not progressed as rapidly as one would expect.

Dr. Hoag, in closing the discussion, speaking of the age of this patient, said that in one of the cases reported by Osler at the Johns Hopkins Hospital the patient was then 28 years of age and had had the disease for ten years. In two or three of Mackey's cases the patients were under 30, and in one case reported by King the disease had its onset in early life, although it was usually looked for between thirty and fifty.

Although paramyoclonus multiplex was one of the diseases with which Huntington's disease might occasionally be confounded, in this case we have the long line of hereditary taint, with the history of progressive mental enfeeblement, particularly characteristic of Huntington's disease, and not of the others. Again, in paramyoclonus multiplex the muscular contractions are usually quicker and follow each other more rapidly. They seldom occur during repose or during voluntary muscular exertion.

DREAMS: THEIR MECHANISM AND THEIR INTERPRETATION

By Morton Prince, M.D.

The author stated that the problem of the interpretation of dreams involved the question whether dreams were to be regarded as mere fantastic imagery, without law or order, or whether all the phenomena of the mind could be reduced to an orderly and intelligible sequence of events, as was the case in the physical universe. If the latter be true, then every mental event ought to be related to and determined by an antecedent event. The difficulty of the problem lay principally in the

complexity of psychical phenomena, the difficulty of ascertaining all the antecedent events or data, the necessity of depending upon memory to reproduce past mental experiences which contained the data, and the possible fallacies of the final logical interpretation.

Notwithstanding these difficulties, recent investigations under the leadership of Freud had shown, the speaker believed, that dreams could be so related to antecedent psychical events that they could be recognized to be not haphazard vagaries, but orderly determined phenomena capable of logical interpretation. The solution of the problem of dreams required the determination of (1) the source of the psychological material out of which the content of the dream was fabricated; (2) the nature and mechanism of the motivating process which determined the dream, both as to its occurrence and form; (3) the logical meaning, if any, of the dream itself. The problem was to determine the relation, if any, between the dream and such antecedent mental and physiological experiences and co-active sensory stimuli, and it was evident that to determine such relations it was necessary to obtain all the data, *i. e.*, memories of all the events that entered into the relation. It was well known that some people did not remember their dreams at all, while others remembered them very imperfectly, and a very serious doubt arose whether any one remembered his dreams completely from end to end in all their details. Even when apparently remembered, the dream often very quickly vanished, in its details at least, before we could tell it. That the dream was very much fuller than the memory of it could often be shown by restoring the memory by artificial devices, such as abstraction, hypnotism, automatic writing, crystal vision, etc. This was in agreement with what we knew of allied phenomena. A dream might be defined as a delirium occurring in a state of dissociation, and our waking memories were inadequate to solve the problem of dreams. In other words, all possible memories could not be recovered in any given state, whether waking or artificial. Of our large storehouse of conserved experiences, some could be stimulated into memory in one state and others in another. If we put the person into a given state of hypnosis, we might find that his memory of the dream was fuller and that he recalled a larger number of details, while in another state, such as concentration of attention or abstraction, he might recall a still larger number. The problem then was to interpret the causal relation. For example, the dream might be interpreted as the fulfilment of a wish contained in the revived memories.

More interesting than the interpretation of the dreams were, first, the mechanism by which the motive expressed itself and made use of the material; second, the evidence which this mechanism offered towards the elucidation of many allied phenomena in pathological conditions; and, third, the light which dreams threw upon the hidden habits and processes of thought which tended to disturb the mental equilibrium of the subject, and often to lead to the development of the psychoneuroses.

Dr. Prince said that a study of a large number of the dreams which were analyzed showed that the greater part of the psychological material out of which the dreams were fashioned was furnished by the previous waking thoughts of the dreamer, particularly those disconnected ideas which coursed in a passive, fleeting way through the mind, or rather which made up the stream of consciousness just before going to sleep. This pre-sleeping state had certain marked characteristics which distinguished it from the alert state of waking life. It resembled, if it was not identical,

with what Sidis called the hypnoidal state. In that condition, ideas coursed through the mind in what appeared to be a disconnected fashion, although probably determined by associations. One marked peculiarity of this state was that amnesia for its thoughts rapidly developed. The speaker said he had found in studying dreams that certain elements of the pre-sleeping ideas invariably appeared in the content of the dream. These ideas furnished the material out of which, to a large extent, the dream was formed. Another source of these dream elements—although a less rich one—was the thoughts of the preceding day, and even earlier mental experiences. The same might be said of ideas and feelings which had dominated the psychological life of the individual through a long period of time. These latter exhibited certain special peculiarities in the dream in that they were apt to be symbolized. Dr. Prince said his own observations confirmed those of Freud so far as to show that running through each dream there was an intelligent motive, so that the dream could be interpreted as expressing some idea or ideas which the dreamer previously had entertained; at least, all the dreams he had subjected to analysis justified this interpretation.

Another instructive fact was the persistence of certain of the dream phenomena after waking. For example, in one of his cases, the subject was partially blinded in her dream, and on waking, this partial blindness persisted. Another phenomenon was persisting paralysis after waking. Here we had, it seemed, evidence which forced the conclusion of an unconscious process which revealed itself through conscious and somatic phenomena. The speaker also pointed out that the hysterical stigmata following the dreams were originally in the dreams either symbolic representations or immediate representations of certain previously conceived ideas. These considerations suggested whether we might not logically consider all the conventional stigmata of hysteria from this point of view, and investigate them as possible symbolisms of hidden processes of thought.

In connection with this paper, Dr. Prince reported in detail a number of dreams that had been subjected to analysis by him.

Dr. A. A. Brill said that from time immemorial the dream had been the subject of much interest and speculation. Since the early Greek period, numerous theories had been propounded and entertained, both in the realms of religion and science, but not until within recent years had the dream been studied from a true psychological basis. Modern psychology had made valuable contributions to the problem of the dream, but no author, to the speaker's knowledge, had solved the problem as ingeniously and truly as Professor Freud, of Vienna. To understand the conception of the dream, it would be necessary to outline Freud's theory of hysteria. According to Freud, a hysterical symptom was a symbolic representation of a former mental pain. To illustrate: a person was subjected to a number of mental pangs in the form of misfortunes, insults, disappointments, etc., to which he happened to be unable to react adequately. These emotionally accentuated ideas, because of their disagreeable content, were in time forgotten or crowded out of the mind; that is, they were really not obliterated, but repressed into the subconscious, forming what Dr. Jung, of Zurich, called "complexes." In a person predisposed, the complexes could not be vanquished by the psychic forces of the individual; the various conflicting ideas and emotions could not be brought into harmony with the rest of the personality, and hence a

splitting of consciousness resulted, and by a process of conversion the original psychic pains became transformed into a physical symptom. The person then forgot the original episodes, and had instead a painful leg or arm or a hysterical attack which he usually attributed to "catching cold," "overwork," etc. To cure these symptoms it was necessary to find the original episode. This was a very difficult problem, as in the first place the symptom formation was a totally unconscious mechanism, and hence the patient could give no information about it; and, secondly, there were always psychic resistances against its becoming conscious, so as to protect the individual from mental pain. To overcome all difficulties, Freud used what he called the psychanalytic method. After the patient told all he consciously knew of his malady, he was asked to repeat what came to his mind. He was told not to criticise nor repudiate any idea merely because he thought it was senseless and had no bearing on the subject matter, but to state all his ideas, no matter what they were. In this way the resistances were gradually broken, and the symptom could then be interpreted. This was a long, painstaking and most complicated process, and could only be accomplished by those who thoroughly mastered Freud's psychology.

It was during the discovery of this method that Freud found what a great role the dream played in the psychological make-up of the individual. As already stated, the psychic resistances prevented the painful reminiscences from becoming conscious in order not to subject the individual to pain. During our sleep, however, these resistances were considerably diminished, and hence the complexes came to the surface in the form of dreams. The dream, therefore, was merely a number of distorted ideas which were once conscious, and then repressed into the sub-conscious. The distortions might be due to the transposition of events, the fusion of words and pictures, to symbolic expressions and other factors. The thoughts which we recalled on awakening were merely the manifest thoughts of the dream, while after the analysis we had the latent thoughts of the dream. The former were absurd and meaningless, while the latter were the actual inmost thoughts of the individual. To interpret a dream was to translate the manifest into the latent thoughts.

Dr. B. Onuf said that while he agreed with many of the views contained in Dr. Prince's paper, he thought that in some respects full justice had not been done to the interpretations of Freud. In taking up this subject and studying Freud's book, one could not but be impressed by his work and its logical findings, although Dr. Onuf said he could not indorse them in their entirety, and was particularly in doubt as to the dictum that the dream might be interpreted as the fulfilment of a wish. The speaker's own experience in the study of dreams confirmed the theory of Freud that in dreams we found a very marked work of condensation; that is, persons pictured in dreams, for instance, often represented a mixture of different persons, so that the face could be borrowed from one individual, the dress from another, and the attitude or manner or the utterance from still another. We also find so-called displacements of emotion which explain many of the absurdities of dreams. Dr. Onuf then illustrated in what manner such displacements of emotion take place and called attention to the parallelism between hysterical phenomena and dream phenomena as regards their mechanism.

He pointed out that while Dr. Prince's study of dreams as a hysterical subject were very interesting and very valuable contributions, yet those

who had any objection to identifying processes found in normal individuals with those found under pathological conditions might contend that the dreams of the hysterical were abnormal, and therefore did not give us a true representation of the mechanism of real dreams. Therefore, to study the dreams of normal persons and find their resemblance with hysterical phenomena was perhaps more convincing than to find a resemblance between the dreams of hysterical persons on the one side and their hysterical manifestation on the other, until the identity or close correspondence of the mechanism of dreams of normal persons with that of hysterical or otherwise neurotic subjects had been clearly shown. The speaker said that in dreams in normal subjects he did not think we were so apt to have a recurrence of the same phenomena, and that constant recurrence of similar dream phenomena night after night suggested a pathological condition, frequently hysteria.

The following officers were elected for the ensuing year: President, Dr. J. Ramsay Hunt; First Vice-President, Dr. L. Pierce Clark; Second Vice-President, Dr. Smith Ely Jelliffe; Corresponding Secretary, Dr. B. Onuf; Recording Secretary and Treasurer, Dr. Edwin G. Zabriskie.

THE PHILADELPHIA NEUROLOGICAL SOCIETY

January 28, 1910

The President, DR. THEODORE WEISENBURG, in the Chair

POLIOMYELITIS ANTERIOR

By Wharton Sinkler, M.D.

Dr. Sinkler presented a case of poliomyelitis in which the paralysis was confined to the shoulder girdle on both sides. The patient was a male, aged 20, white and single; cigarmaker by occupation. There was no history of syphilis or any serious illness. He was perfectly well until the onset of the present trouble. On September 8, 1908, the patient felt slightly unwell. He noticed that his hands trembled a little as he worked. He retired at the usual hour and on waking the next morning he found that he had loss of muscular power in both shoulders, arms and forearms. He had a temperature of 104°. There was no pain present. After a day or two the fever subsided and he felt quite well, but for three weeks or more he was unable to feed himself or to use the hands in any way. After about four weeks the forearms began to improve and in a short time he fully regained power in the use of his hands. At the present time he has good use of the hands and there is no wasting in the muscles of the forearms. Dynamometer, right 160; left 110. The muscles of the shoulders, including the scapula muscles and the pectorals, are atrophied to a marked extent. Although the upper arm is somewhat wasted, the patient can flex and extend the arms.

The electrical examination is interesting and different from what would be expected. K. Cl. C. greater than An. Cl. C. in the shoulder and arm muscles, but it takes twice as strong a current as should be necessary to get a response. Faradic response is present in all muscles but it also requires a very strong current.

There is no history of an epidemic of poliomyelitis at the time of the patient's attack.

Dr. Spiller said the lesion must unquestionably have its location at the fifth and sixth cervical segments, but he was surprised at the symmetry of the condition. Poliomyelitis seldom gives a symmetrical paralysis on the two sides of the body. There must also be involvement of the pyramidal columns, as the tendon reflexes of the lower limbs were exaggerated, yet that involvement of the pyramidal tracts must not be very extensive or the patient would have weakness, which he says he never has had.

Dr. S. D. W. Ludlum said that in feeling the spinal column it seemed to him there was a prominence over the sixth cervical vertebra as though it might be a tuberculous condition of the vertebra.

Dr. F. X. Dercum said that among other things, the diagnosis of motor neuritis might suggest itself; however a pure multiple motor neuritis is exceedingly rare. It appeared to him that in spite of the symmetry of the symptoms, the diagnosis of a poliomyelitis was unavoidable.

Dr. Sinkler said no X-ray had been taken. In poliomyelitis the distribution may be symmetrical. This is a very unusual distribution, and Dr. Sinkler said he did not think he had ever seen it before, although it is quite common for one arm, especially the upper arm to be the subject of poliomyelitis. We have two or three points which make diagnosis clear. First, the sudden onset with high temperature, coming on over night just as in a child. Second, the season of the year; September is one of the most frequent months for the onset of poliomyelitis. Third, the rapid regression from the lower part of the arm in three or four weeks. The absence of pain precludes a hemorrhage or a cervical pachymeningitis. Dr. Sinkler said he did not know how to explain the increase of knee jerks. It may be accidental as in neurasthenics.

Dr. F. X. Dercum presented a case of scleroderma.

Dr. Tom A. Williams said he thought we should interpret this case a little on the lines which Grasset has discussed, that is the intimate relation between the conditions of scleroderma, Raynaud's disease and erythromelalgia, and regard them all as neural in genesis. It seems that this patient has had neuritic symptoms, which are still present in a degree. The affection is not a mere dystrophy or local systemic dystrophy, but an atrophy determined neurally. It seems evident, taking a long view of the history of this case, that one of the stages was swelling. This case seems to be clinically a demonstration that edema and atrophy are really stages of development of the same disease. As to what the cause of the changes may be is still a subject for research.

A CASE OF MERCURIAL TREMOR

By Augustus A. Eshner, M.D.

C. E., a man, 50 years old, born in Sweden, and for fifteen years employed in the manufacture of felt hats, stiff and soft and of all colors, presented himself on account of general nervousness. For three months he had noticed a widespread tremor of the body, associated with progressive weakness. The voice also was tremulous, but the tremor was most

marked in the hands and particularly the right hand. The patient was conscious of a sense of fatigue, but he was able to keep on with his work. Vision had been poor since early life, and this was found to be due to haziness of the corneæ from antecedent trachoma. There was no nystagmus. The hands exhibited a coarse tremor on movement increased by attempts at suppression. Tremor was present also in the lower extremities in less marked degree, and also in the tongue and the muscles of the face. The dynamometer registered 142 on the right, 122 on the left. The knee-jerks were preserved. Gait and station were good. There was increased frequency of micturition, but the action of the sphincters was under control. The teeth were the seat of a blackish green deposit, and the gums presented a blue line at their margin. The man was unaware of the presence of any special chemical in the materials handled by him, but inquiry of the firm that supplied the felt elicited the statement that this material was subjected to the action of a solution of mercury in nitric acid, and that some of the men engaged in this process occasionally exhibited a tremor of the extremities popularly known as the "shake," for the prevention of which they drank milk and abstained from alcohol. The patient has improved under treatment with potassium iodid, laxative doses of magnesium sulphate and massage.

Dr. Dercum called attention to the remarkable difference in the symptoms of mercurial poisoning produced by inhalation and the symptoms produced by mercurial poisoning when the drug is taken internally or administered by inunctions. This fact is, of course, well known. The patient under discussion for instance did not present any tenderness of the gums, salivation, loss of teeth or diarrhea. Because of the very peculiar effects of the poisoning when inhaled, Dr. Dercum thought possibly a special chemical compound was formed with the proteids, one differing from that formed by the poison under other circumstances. While toxicity is present in both forms of poisoning, the symptoms are so different as really to suggest different poisons.

Dr. Tom A. Williams said he had noticed in two or three cases which were subjected to mercurial injections a coarse intention tremor, which as a rule lasted for an hour or two. It was of the type shown by the patient exhibited. It often leads to a certain agitated clumsiness. The people sometimes miss their saucer, or spoon, or jerk their arm, or do something of the kind; and it is interesting, as Dr. Eshner said, to note that drinking milk cures the patients. In that respect they resemble the cases of caffeine poisoning which are characterized by agitation and which are relieved by food. Dr. Williams said he remembered seeing three cases, and had remarked it in his own person after excess of tea or coffee. His tremor was exaggerated by exercise and mitigated by food.

Dr. Sinkler said he had seen two or three cases of mercurial poisoning in hatters. They all presented the same symptoms as this man did, a coarse tremor. There is one process in the manufacture of hats, the felting process in which mercury is used and he had been told that the manufacturers all do not use the same amount of mercury in the felt, nor is it always necessary to use it. How true that statement is he did not know.

Dr. Alfred Gordon said in regard to the diagnosis: if this patient did not present any other symptoms than the tremor, how would we make a diagnosis on that? It is extremely difficult to make a diagnosis. He

had observed identical tremors in morphine poisoning. In several cases intention tremor was observed and no other symptom. In any case of tremor without a history it is difficult to make a differential diagnosis, especially as there are cases where you have frequently inorganic poisoning, together with alcoholism which of course complicates matters. The case is very interesting and if this patient does not present any other symptom, he would be very much embarrassed in making a diagnosis.

Dr. S. D. W. Ludlum said he had seen a case in Dr. Spiller's service in which in addition to the tremor the patient had marked weakness of the legs. It was very marked. He could hardly walk at all. The length of time it took him to get well from most of his symptoms was about six months.

Dr. W. G. Spiller stated that the man of whom Dr. Ludlum spoke was seen several years ago. He had marked tremor of the face over the lower jaw as well as in his hands. Dr. Spiller asked the patient to find out how the mercury was used, and it was stated that the mercury was used to loosen the hair from the hide. The man told Dr. Spiller that there were other men in the establishment affected in the same way. As to the remark about diagnosis made by Dr. Gordon, we could not diagnose without a history. There is nothing especially characteristic excepting that the tremor may be coarser than in alcoholism.

Dr. Eshner said that the difference between this industrial form of mercurial poisoning and the medicinal form alluded to may reside in the fact that the one is chronic and insidious in onset, while the other is commonly an acute condition. The one affects especially the nervous system, while the other affects particularly the eliminative organs, the glandular structures of the digestive tract.

A CASE OF ANTERIOR POLIOMYELITIS WITH UNUSUAL DISTRIBUTION

By Alfred Gordon, M.D.

A boy of nine had in his infancy several infectious diseases in succession: pneumonia, bronchitis, meningitis and measles. The latter affection occurred at the age of twenty months. At that time his mother noticed that his left arm would hang along his trunk without motion. At present his condition is as follows. The left shoulder is drooping and the left arm hangs loosely. There is a subluxation of the head of the left humerus. Raising of the left arm is difficult and cannot be done above the shoulder. Abduction of the left arm is almost impossible. Flexion and extension of the arm are well preserved. The grip is equal on both sides. Shrugging of the shoulder is impossible on the left side, but poor on the right. Abduction of the right arm is also poor. There is a distinct atrophy of the left deltoid and trapezius and to a lesser extent of the corresponding muscles on the right side.

The scapulæ even at rest are receding from the thorax on both sides, more on the left than on the right and this is particularly marked when the arms are stretched out. The supra- and infraspinati muscles are atrophied more on the left than on the right. Bechterew's reflex is exaggerated on both sides, more on the right than on the left side. The

upper thorax in front shows some atrophy. The entire atrophied area is animated with fibrillary contractions and reactions of degeneration are observed in the left trapezius and deltoid: the other atrophied muscles show so far only a diminution to galvanic and faradic currents. The biceps and triceps reflexes are somewhat exaggerated. The knee-jerks are decidedly increased. Scoliosis with the concavity directed to the left is observed. The boy's mentality is below normal.

The distribution of the atrophy is quite unusual. In Erb's type of dystrophy the atrophy mainly affects the shoulder girdle and there is usually no RD. In acute anterior poliomyelitis the involvement of the trapezius is a great rarity. In chronic anterior poliomyelitis the Aran-Duchenne type is the predominant one. So it is in amyotrophic lateral sclerosis, which, however, is suggestive here in view of the condition of the tendon reflexes. The absence of reactions of degeneration on the right side and in other muscles except the left trapezius and deltoid makes one think of muscular dystrophy in addition to poliomyelitis. The case is probably one of a mixed form.

CASE II. EXTERNAL OPHTHALMOPLÉGIA FOLLOWED BY EXOPHTHALMIC GOITER

A middle-aged woman observed nine months ago that she could not turn her left eye toward the left. At that time she came under observation. A palsy of the external rectus of the left eye was present. Two days later the pathological process, whatever it may have been, spread to other ocular muscles. Soon she presented in the right eye a paralysis of the internal, external, superior and inferior recti, and in the left in addition to the external rectus also the superior rectus became involved. That condition remained unaltered up to the present day. The pupils were equal at that time, but now an inequality is seen: the right larger than the left. About five or six days later, viz., after the palsies became established, patient noticed a gradually developing prominence of the eyeball. At the same time she developed a tremor of the hands, cardiac palpitation, flushes of heat. She also noticed then that her collar began to be tight around the neck. She presents now a slight but a distinct enlargement of the thyroid gland. The case was therefore first an external ophthalmoplegia and then an exophthalmic goiter. It is absolutely identical with another case exhibited before the Philadelphia Neurological Society, April, 1905 (see *New York Med. Jour.*, November 4, 1905). These two cases corroborate the contention that the lesion lies originally in the medulla. The exophthalmic goiter here followed an involvement of the nuclei of the third and sixth nerves. They support also the view based on experimental and anatomical researches all showing that the bulb being diseased is liable to produce the syndrome of Graves' disease.

VASOMOTOR AND TROPHIC DISTURBANCES IN A CASE OF HYSTERIA

Alfred Gordon, M.D.

This young woman presents in her history for the last five years a series of hysterical incidents. Attacks of hiccoughs, of hemiplegia, of monoplegia, of contractures of the fingers, of blindness—occurred at

various intervals and always following an emotion, sad news or fright. At present as well as on previous examinations she presents a complete left hemianesthesia, including the face, tongue, pharynx, ear, scalp, also a very marked concentric contraction of the visual fields, more on the left than on the right. A few weeks ago after a violent emotion she observed a reddish spot over the left breast, and an hour later over the other breast. The erythematous patches very rapidly increased in size. In a few days after a suggestive treatment the patches began to get paler and paler. About a week ago she received bad news from home, which rendered her sleepless that night. The next morning she observed a reddish area on the right side of the neck. Again after a brief treatment an improvement occurred. Two days ago she went to see the body of a relative who died in an accident. She was shocked at the sight of it, did not sleep that night, fainted several times and immediately noticed a reddish spot in front of her neck of about one inch and a half in diameter (patient was exhibited and erythema demonstrated).

In view of the recent communication of Babinski claiming that all vasomotor disturbances in hysteria are the result of fraud and deception on the part of the patient, the present case is an illustration of the fact that such disturbances may occur in hysteria and be caused by hysteria itself. All possibilities of fraud must be excluded in the present case, as a close investigation proved it to be a genuine case of hysterical vasomotor disorder. The girl was so unfortunate through her various disorders, that she implored a number of times to be relieved once for all, as she is very poor and would be anxious to be in good health so as to be able to make a living.

Dr. Tom A. Williams said that the statement made concerning Babinski's views was misleading, because the condition Babinski requires to constitute a symptom a hysterical one is not that it appear as the result of emotion, but that it be reproducible voluntarily through suggestion by the patient or someone else and be susceptible of removal by the patient or someone else by suggestion—persuasion. The great majority of symptoms which we call hysteria do admittedly conform to this definition. There are other symptoms formerly included which do not conform to this etiology and so Babinski ventured to beg the question by saying that these symptoms should not be described as hysterical. Of some symptoms we may postulate that if they are not removable it is because *we* have not the power to remove them in *that particular case*. For instance, Dr. Williams has seen cases in old men who have had astasia abasia for thirty or forty years; no one would expect us currently to remove that condition by persuasion; although it is possible to remove very grave and deeply seated symptoms if you give enough perseverance to the treatment. Many symptoms which are thought to be incurable have proved not so incurable where we give them attention.

As to the vasomotor conditions which are alleged to occur in hysterical cases, Babinski looks on these very differently, but does not say that they are all due to simulation. He says you must exclude from the category of hysteria firstly a large number of psychasthenic symptoms; secondly the trophoneuroses, secretonuroses and vasoneuroses. These are not hysteria: they cannot be affected psychically by the will of the patients or by another's will. Most of us are quite clear that they are essentially different diseases. The case Dr. Dercum showed is an ex-

ample. The third set of phenomena are those which occur episodically occasionally in certain individuals who may or may not be hysterical. Meige's trophoedema is a type of these. Gross changes in the skin never occur either from suggestion or from emotion. Beyond the familiar vasomotor passing phenomena of emotion, it is *possible* that a powerful emotion may produce a condition of prolonged contraction in the small vessels, or perhaps a condition of flushing. That *may* occur as the result of great grief, although it far from demonstrated. But that is not within the patient's will to overcome and you cannot remove it by suggestion. Hence it is a phenomenon essentially different from the induced psychosis. As to the case before us it clearly enters into the category that Dupré calls *mythomanie*. No one present has seen any case of unequivocally genuine phlyctenulae or other stigma where trickery could be eliminated. The lesion in the case shown does not correspond with any known nerve nor metamerie distribution; and the effect is so clean cut, and so evidently produced by a blister that we must suspect that patient's condition has been produced deliberately by vesication. We all know how these patients simulate. Dr. Williams does not think this girl is any exception. Medico-legal annals teem with men and girls who have deceived; and Dr. Gordon's acceptance without reserve of the girl's own desire to work as a refutation of any suspicion that she might simulate seems to Dr. Williams on a par with the belief in Palladino until her actual means of trickery have been exposed. The presumption derived from known cases is too strong to make it justifiable to use such imperfectly analyzed cases to upset all the data of general pathology as well as of morbid psychology.

Dr. Dercum said that cases of skin lesions occurring in hysteria should be regarded with great suspicion. In every case which has been thoroughly investigated, such lesions have been found to be artefacts, that is, produced artificially. Dr. Dercum cited the instance of a hysterical ulcer recently under his observation at the Jefferson Hospital. When the ulcer was covered with a plaster of Paris bandage, so that it was impossible for the patient to interfere with it, it promptly got well.

The patient shown this evening had been for a time in Dr. Dercum's wards at Jefferson Hospital and under his own personal observation. She was extremely hysterical and presented many shifting symptoms. Her mental condition was such that none of her statements could be relied upon. She craved constant attention and repeatedly demanded surgical operation. It so happened that she developed a double otitis media, which necessitated an operation first upon one side and later upon the other. She was so pleased with the attention which she excited, that she at once demanded that her appendix be removed. She was not satisfied unless constant attention was given to her case. It can be readily understood that skin lesions in such a patient cannot be accepted as genuine unless she were practically under strict and continuous observation. It is quite impossible to observe such a patient adequately outside of a hospital ward and indeed even then the observation may not be sufficiently close to prevent the self-production of skin lesions. Until more conclusive evidence can be produced, Babinski's position in regard to such lesions must remain unchallenged.

Dr. Carncross asked how Dr. Gordon explained the involvement of the third nerve in the case shown of exophthalmic goitre. If it was due

to a lesion in the medulla how could it involve the third nerve? There have been cases of involvement of the third nerve in exophthalmic goitre, the question arises whether it is not due to neuritis of the third nerve.

Dr. Gordon said the hemorrhages in the medulla had been found in exophthalmic goitre. These hemorrhages were not confined to one area. They may affect the nucleus of the third or sixth and later some other spot as experimental studies have proven. Dr. Williams gives word for word the same argument that Babinski brought before the Neurological Society first, namely that in each case deception is the cause of the trouble. In regard to this particular patient Dr. Gordon said he had her under his personal observation for several years. She is an exceedingly poor girl and the woman who rooms with her and has to help her when unable to work came to Dr. Gordon and told him how the condition occurred. It is out of the question that there is fraud. She is only too anxious to work and several times implored to be relieved finally from the repeated disorders. The girl after a great emotion, illness and death in her family, came on the following day with large, circular, symmetrical, erythematous spots above the breast. (See photograph in *New York Med. Jour.*, February 5, 1910.) This time she came with exactly identical spots on one side of the neck which faded away in a few days and then appeared on the other side. It is true that hysterical patients are apt to defraud, are apt to tell lies and commit all sorts of offenses, but nevertheless we must acknowledge that there are genuine cases in which vasomotor disturbances are produced not by fraud, that hysteria itself is capable of producing them. The observation of Dr. Allen goes hand in hand with this and the arguments of the other speakers are the same as Babinski's. Since Dr. Gordon's first report of vasomotor hysteria in the *Revue Neurologique*, No. 18, 1908, a number of reports were published in Germany, France and Brazil. Babinski, however, in discussing the matter discards them as not being genuine without explaining why, or how.

Dr. Spiller asked whether Dr. Gordon could recite a single case, with autopsy, of Graves' disease in which there was a hemorrhage in the medulla oblongata, in the pons and in the cerebral peduncle, as must the case to produce the ocular palsies described in his patient.

Dr. Gordon said he did not recall at present cases of that kind, but he does remember cases of exophthalmic goitre experimentally produced by punctures in the medulla.

Dr. Spiller said recent and small hemorrhages in the central nervous system are not unusual and are probably agonal in type. They are frequently found in tissue apparently normal, scattered through the spinal cord and elsewhere. We should be extremely careful in judging of them as hemorrhage preceding death, and of pathological significance.

A SIMPLE CLINICAL METHOD TO DEMONSTRATE AND MEASURE DYSERGIA

By Tom A. Williams, M.D.

By dysergia we mean the lack of harmonious co-operation between the agonist and antagonist muscles required to perform a movement

steadily and in the direction desired by us. This disorder may proceed from lack of information as to the position of the various joints participating in the movement; or it may be due to want of knowledge of the degree of contraction of some or all of the muscles concerned both before and during the act. This condition, however, is spoken of as ataxia.

When, however, the movements are unsteady or unmeasured on account of the irregularity or incompleteness of the efferent nerve impulses which govern the muscles concerned, we speak of the affection as dysergia or dysmetria.

Ataxia can be compensated for by the use of other senses than that of attitude. Thus, the locomotor disorder of tabes dorsalis can be largely overcome by practice under the direction of vision. By this means, a new set of muscle-habits is learned which makes use of the scanty information to be derived from the diminished attitude-sense of the patient. The Fraenkel treatment depends upon this principle.

The dysergic patient, on the contrary, does not appear to be re-educable, as far as present information goes.

Thus, the diagnosis between these two conditions is one of great practical importance; and not only so, but a quantitative estimation of dysergia should afford valuable information as to the progress for better or worse of the disease which causes the dysergia.

Accordingly, the following method should be of clinical service in these respects. It depends upon the fact that when a dysmetric patient endeavors to abruptly arrest any movement he has begun, he can neither do so nor prevent an excessive movement from occurring in the reverse direction.

So that when the patient, in drawing a straight line, tries to arrest the movement at a fixed point, he will be unable to do so, the pencil travelling beyond. A practical application of this test is as follows: A horizontal (A) line is drawn across a piece of paper. A perpendicular (B) is let down from its left extremity. Three vertical marks a b c are made at equal distances along the horizontal line. The patient is then directed to draw, beginning at the vertical line, three horizontal lines (1) (2) (3) one below the other, and each stopping abruptly at the marks (a) (b) (c) respectively. They must be drawn rapidly, and each with a single movement. The normal person will pass the limit only very slightly, and will make hardly any returning stroke or movement of the arm. Cerebellar dysergia is indicated by excessive length, and especially by a too great movement of recovery whether the paper is marked or not.

A patient with ataxia is usually able to arrest the movement near the desired place; or if not, the line is an irregular and trembling one.

The quantitative estimation is made by adding together the lengths of the three lines made on the paper during the return movement of the pencil after the patient has arrested the line he is directed to draw. The sum of these lines can then be compared with the sum of three lines drawn later in the course of the case and with the figures drawn in other cases. The method is thus a means of clinical comparison, and is useful in case histories.

The patient from whom the charts are taken suffers only from dysmetria and asthenia. The latter is due to the intensity of the efforts required to compensate for his dysergia in using a typewriter and in walking. The cause of his disease is probably a sclerosis of the cere-

bellum due to arterial thrombi the result of severe malaria; for he has been in this condition for eleven years with only slightly increased impairment recently, and there are no other signs of intracranial disease to lead one to suspect a neoplasm. It is right to add, however, that paresis of the hands and feet is present. Some physicians believe him to have tabes dorsalis; but dysdiadokokinesis and the above sign show that the symptoms are cerebellar.

A CONVENIENT INSTRUMENT FOR READY CLINICAL INVESTIGATION OF THE SENSIBILITY TO COOLNESS AND WARMTH

By Tom A. Williams, M.D.

When the spinal column is injured, it becomes of great importance to the surgeon to know whether a consequent paralysis or loss of sensibility arises from damage to the cord itself or implication of the roots or of a plexus in the vicinity. Since the researches of Head and Sherren and Head and Thompson, the means for making this distinction are clinically available. It will be recalled that stimuli as they pass from periphery to central end organ, are grouped in quite a different way in the peripheral nerves to the manner in which they are collected in the spinal cord.

Thus, it has long been known that in the latter all the impulses of painful sensations run together in the heterolateral Gowers' tract, and that a lesion which interfered with any kind of pain always interferes with all kinds of pain. As is well known the sensibility to cold and heat is conducted along the same tract as that of pain, although not in the same fibers; for one may be lost without the other, and either or both may be lost, while the sensibility to pain is intact and *vice versa*, although any of these combinations is rare on account of the close proximity and interlacement of the conducting paths.

Again the knowledge of the attitude of our limbs is derived from impulses which mount the cord in the homolateral dorsal column, and they are there accompanied by fibres which make possible our appreciation of the locality of touch and of the distinguishing of the simultaneous touch of two points, at a distance from one another which varies on different parts of the body.

On the hand, this latter test is the most convenient for determining whether a lesion is in the cord or in the periphery; for in the latter case the loss of spacing sense is always accompanied by a proportionate loss of the superficial sensibility for distinguishing light touches and appreciating coolness and warmth, that is, temperatures between about 20° C. and 40° C. In a lesion of the cord, however, there may be a loss of spacing sense without the least incapacity to appreciate either heat or cold and without loss of feeling to the lightest touches with cotton wool; but there is then always a concomitant loss of the sense of attitudes.

In the lower limbs, the compass test is not of great applicability; for the circle of discrimination is very wide, and people are not accustomed to this type of discrimination. The hairiness of the lower limbs, moreover, vitiates the testing of fine touch with cotton wool; for the order of

sensibility excited by the stimulation of a hair is different from the epicritic (as Head has called it) which is resident in smooth skin. Hence, to distinguish between peripheral lesions and those of the cord clinical practicability requires the use of a different quantitative test; and it is for convenience in making this that I have devised the instrument now presented.

For estimating degrees of sensibility to temperature, Head had used silver test-tubes containing water at a temperature ascertained by a thermometer placed in the tube. Now, silver tubes are expensive, and the insertion of a thermometer is inconvenient. Besides, in a small tube, the loss of temperature is rapid. So in my instrument copper is used for it is nearly as good a conductor and much less expensive. It is used in a block, and not as a tube, again saving expense. The thermometer is firmly attached to the instrument, which greatly adds to its convenience; and lastly rapid loss of heat is compensated for very simply; for the desired temperature is reached by plunging the base of the instrument into water in a large vessel, the total body of which retains its temperature much longer than does an instrument of any practicable size unless electrically heated as in the instrument recently devised by Mills, the expense of which precludes its general use.

The apparatus consists of a cube of cast copper 3 x 3 x 3 centimeters tunnelled out in the centre to within two millimeters of the opposite surface. Into the tunnel is inserted the bulb of a thermometer of the kind used in storage warehouses. It registers from 10° F. to 140° F. This thermometer has been selected only for its availability: for the range of temperature need not be so great; but it is a safeguard against breakage. The whole is mounted upon a wooden holder along a groove in which the thermometer is embedded for protection. The scale is easy to read as it lies in the furrow. For convenience of manufacture, the copper block is made in two equal parts furrowed in such a way that the approximation of the grooves forms a circular tunnel for the thermometer. The two halves are clamped together with four copper screws; and the whole is in turn screwed to a strip of brass one eighth inch thick and 3 c. wide. The brass fits along a bevelled-out surface of the block, which extends to within two millimeters of the foot. The brass strip is screwed also to the wooden handle which carries the thermometer scale, thus making the whole solid and giving a uniform surface of copper to place against the skin of the patient being examined.

To use the instrument, it is plunged into a large jug of water at a temperature approximating to that desired, say 25° C., when testing for appreciation of coolness, or 40° C. when testing the appreciation of warmth. It is very easy by adding cold water or hot water to obtain any temperature desired in the large vessels; and this will remain practically constant long enough to enable a series of observations to be taken sufficiently complete for current clinical use. Of course, it is easier to obtain accurate results when two instruments are used, one cool the other warm; for it is then more easy to control the tendency of patients to continue to call all temperature stimuli by the name they use for the first stimulus felt. Any indifferent metallic substance may, however, be employed satisfactorily to eliminate this fallacy.

Of course the instrument does not pretend to be a substitute for clinical acumen; no apparatus can do that; but it is a convenience; and,

furthermore, affords a ready means for ascertaining data for purposes of comparison with the cases of other observers. It is thus useful both in the practice of medical, and especially surgical, art, and in the compilation of the records which further the advancement of science.

AN ANOMALY IN SENSIBILITY DURING ACUTE SEROUS MENINGITIS: A CLINICAL NOTE

By Tom A. Williams, M.D.

After being thrown from a trap when intoxicated, a farmer of sixty-one, during ten days gradually became delirious and quadriplegic with rectal and vesical incontinence. He had been a hard drinker; and for two years had suffered from numb feelings and coldness of hands and feet without pain or loss of power.

Motility.—On examination ten days after the accident, there was complete paralysis below the second thoracic segment and also of the right triceps innervation, other arm movements being conserved, although much impaired, especially distally. Facial and neck movements were strong.

All *reflexes* were then absent, with the exception of a slight dorsi-flexion of the left great toe. In his delirious state the *sensibility* could be examined only roughly; but it was clear that the right side was quite insensitive to pain and temperature as high as the second intercostal space, although no abnormality was then detected on the left side. Bed sores began to appear.

The Anomaly.—It was only five days later, after the deep reflexes had returned and the great toe had ceased to extend, that there was detected the curious anomaly of dissociated sensation which it is desired to record. On the left side as high as Th 2, a sensation of coolness was immediately reported when he was touched with an object at a temperature of 60° F., but when he was touched with a tube containing ice, no sensation of cold whatever was felt, the patient immediately calling out with pain, crying "it sticks."

He could appreciate the painfulness as well as the temperature of a tube of boiling water; and felt no pain, although he distinguished the warmth of a tube a little over blood heat. There was marked hyperesthesia to pin prick and to deep pressure over this area. Light touches could be felt on both sides, although less easily on the right, especially distally. The sense of attitude was completely lost in both lower limbs, and appeared to be impaired in the upper limbs.

Without going into further detail, although the case presents many other points of interest which are reserved for a future communication, it was emphasized that the failure to appreciate cold as such still persists on the left side one month later; but the patient now declares that it *burns*. The hyperesthesia is less intense, and the sensibility has now returned on both sides as low as Th 6th.

As to etiology, the lesion was thought to be hematomyelia, but no blood was found in the cerebro-spinal fluid, in which it was reported that lymphocytes were abundant. Noguchi reaction negative. Dr. Carr, hearing of the cases of Murrey of Boston, and Victor Horsley of London, believed that a serous meningitis might be present and resolved to operate eight days after admission. He selected the fifth cervical vertebra on

account of a slight asymmetry there, although the X-ray revealed nothing. No abnormality of cord or meninges was found; but about 6 oz. of serous fluid welled out when the bulging dura was incised.

The disordered sensibility was of a syringo-myelic type as regards the right-sided loss to impressions of pain and change of temperature. But on the left side the pain and temperature impulses passed with increased facility and the patient's sensibility was only below the normal as to perception of extreme cold.

As far as this goes it conforms to what Head has described as a loss of protopathic sensibility; but in its completeness this comprises also loss of perception of high temperature and superficial pain as well. Moreover, its impairment is always due to peripheral nerve lesion and never to interruption of afferent impulses within the central nervous system where they are grouped into tracts respectively conveying (1) all forms of touch, (2) sense of attitudes, conscious and unconscious, (3) all forms of pain, (4) in close proximity to the last and contiguous or intermingled all perception of change of temperature. The patient's anomaly does not conform to either the peripheral or spinal type, hence it is worthy of record in order that other observations may furnish comparative data for the solution, for that is at present a problem requiring data.

Dr. Tom A. Williams reported (1) a method of estimating cerebellar dysergia, (2) an anomaly of sensibility in the course of an acute serous meningitis, (3) an apparatus for ready clinical investigation of the sensibility of coolness and warmth.

Dr. Milton K. Meyers reported a case of paralysis agitans with occasional slight tremor; vitiligo was the first symptom that was present.

Dr. William Burdick read a paper on a study of functional exercises in some nervous diseases.

Dr. J. Madison Taylor said that the systematic use of coordinated movements is of the greatest value and that he was glad the subject had been presented before the Neurological Society.

Dr. Burdick said he feared to weary the society by giving the details of his movements. They are Fraenkel's movements modified. It is practically teaching a man to walk again. You get him to walk three inches with support on both sides. The first thing to teach him after teaching how to rise from chair is a side step, because the motion is all in one plane. It is a matter of getting a man to do a small movement and increasing the distance. As soon as you get a man to do a small movement have him do more. Several of the cases have had five years of active work and their ability has increased as the result of increased locomotion.

Dr. Spiller said that the man whose posterior roots had been cut had progressed remarkably in walking under Dr. Burdick's instruction. It is an exceedingly important part of the treatment of these spastic cases after operation. After the posterior roots have been cut and the spasticity has been replaced by a normal degree of tonicity instruction in walking is necessary.

Dr. Taylor said the particular line of exercises Dr. Burdick had suggested led him to say that in connection with a very considerable number of symptoms, and sometimes mere functional disease, systematized exercise is of extreme value. A good many such cases fall into his hands

and he gets results by similar and more elaborate methods most satisfactory to him and the patients and he does not think that matter has been brought to neurological attention as much as it should be. He will feel encouraged to make a presentation of especially efficient methods himself soon.

Dr. Gordon thought there can not be enough emphasis laid on the extraordinary results that we can get from systematic exercise. Each case should be studied individually. He has had cases of poliomyelitis, cases of muscular incoordination from various causes, cases of cerebellar disease with a tendency to walk to one side and cases of foot drop, and when treatment was persisted in a sufficiently long time, even with apparent absence of improvement in the first few weeks, good results were obtained in the end. Dr. Gordon said he has now a man with an affection of the *conus medullaris* and marked muscular atrophy; the patient was first actually carried in the office; at the present time he walks around the house. It took three months before considerable results were obtained. He thought Dr. Burdick's results extremely satisfactory and that they should stimulate us to repeat them.

Dr. Burdick said he did not stop at making the patient walk. If he be a carpenter he works toward the end of making him able to resume carpenter work, if a bar tender to attend bar, if a gardner to push a lawn mower. He tries to make it possible for the man to get back to work. That is the reason he uses functional movements, rather than merely getting them back to locomotion. It makes no difference what the man has to make his living at, our business is to enable him to get back at that. As to the different kinds of cases one very interesting case of diffuse degeneration of the spinal cord was treated in which as long as the patient exercised she seemed to keep the disease from progress, as soon as she stopped she went backwards. That was the experience of Dr. Putnam, of Boston.

Dr. Milton K. Meyers asked if Dr. Burdick had any experience in the form of "falling" exercises in paralysis agitans, originated by Freidlander, in which the various parts of the body are brought to relax to such an extent that they may fall against gravity.

Dr. Burdick said he had had none. He had treated cases of paralysis agitans but the help was only temporary. In these cases particularly one must always have some definite purpose. One man he treated never could turn his hand over, unless he had a definite point to touch. They seem to get some relaxation from their contractures and one improved his manner of walking.

Dr. Samuel Stern read a paper on Kernig's sign, its presence and significance in general paresis of the insane and in what he termed arterio-capillary fibrosis.

NEW YORK NEUROLOGICAL SOCIETY

February 1, 1910

The President, DR. J. RAMSAY HUNT, in the Chair

A CASE OF TETANY

By Dr. Charles G. Taylor

The patient was a girl, ten years old, a native of the United States. Her father was an Austrian; her mother a Russian. About five months

ago the patient first began to suffer from a tonic spasm of the right hand, affecting the hand and lower arm muscles. Soon afterwards the left hand and arm became similarly affected. At first the attacks lasted about five minutes. They recurred about twice a week and became more severe, and were accompanied by pain and paresthesia. The first attack came on while the patient was writing, and this brought on many subsequent attacks. Trousseau's sign—the rapid production of a cramp by pressure—was present, and the electrical excitability of the motor nerves was greatly increased.

Dr. Joseph Fraenkel asked how frequent tetany was in New York. With the exception of the case shown by Dr. Taylor at this meeting, he had seen only one other case in this country. In Vienna, during his college days, he had seen a good many.

The president, Dr. J. Ramsay Hunt, said he had seen in New York only two cases in adults, both Italians. In infants and very young children it seemed to be a very frequent condition.

Dr. J. Arthur Booth said he saw one case in the French Hospital about two years ago.

Dr. Charles K. Mills, of Philadelphia, read a paper on "The Sensory Functions Attributed to the Seventh Nerve." (*See this Journal*, p. 273.)

Dr. Charles L. Dana said that Dr. Mills had discussed two different topics, one, as to whether the seventh nerve had sensory fibres throughout its motor distribution; the other, its relationship to the nerve of Wrisberg and the geniculate ganglion. As to the first proposition, he was practically in accord with Dr. Mills as to the fact that there was no distinction between epicritic and protopathic sensibility in the distribution of the fifth or seventh nerve. When Head first published his paper on this subject, he said nothing about the fifth nerve, apparently not having made experiments upon it. With that fact in mind, when suitable cases subsequently presented themselves, Dr. Dana studied the fifth and seventh nerves and was able to demonstrate satisfactorily that there was no epicritic nor protopathic sensibility left after the trigeminus had been cut, but that all forms of sensibility were lost. He sent the result of these experiments to Head, who replied that it was exactly what he expected; that he did not claim that this peculiar difference applied to the cranial nerves, but that it did apply to the spinal nerves.

Dr. Dana thought we were in a position to say positively that all forms of sensibility of the face were supplied by the trigeminus, and none at all by the facial. He admired Dr. Mills' courage in saying that limited inflammation of the geniculate ganglion might produce a syndrome whose factors were loss or perversion of taste; this, the speaker said, was contrary to his own early views at least, and he referred to one of his early articles in which he tried to prove that the sensation of taste in the anterior two thirds of the tongue came sometimes, at least, from the glossopharyngeal.

As to the role of the geniculate ganglion in connection with herpetic eruptions about the auricle and external tympanic membrane, Dr. Dana said he was not so well prepared to speak as Dr. Hunt, who had worked up the subject with great care and had reported at least one case, he believed, where such an eruption was associated with actual disease of the geniculate ganglion.

Dr. Hunt expressed his gratification that Dr. Mills had taken up this

subject in so impartial a manner, which he felt certain would stimulate further investigation, and perhaps tend to produce a little more activity in connection with some of these questions, which were of distinct clinical value.

Dr. Hunt said he believed that the geniculate, glossopharyngeal and the vagus ganglia were all represented to a greater or less degree in the external ear, although this representation was comparatively slight. Furthermore, he believed that as the glossopharyngeal and the vagus had a distribution within the buccal cavity, so the geniculate ganglion had a remnant of distribution in that area as well. These were *branchial* nerves, whose distribution in that region was well marked in the lower form of life, and he believed that they were still represented to a greater or less degree in man.

As regarded the vulnerability of the geniculate and acoustic ganglia to herpetic inflammations (posterior poliomyelitis), he differed from Dr. Mills in that he did not regard herpes zoster as a skin disease, but rather as a skin reaction to a central nervous disease. As regards the conchal hypesthesia in facial palsy, further investigations will be required to show how frequently this is present. This diminution of the tactile sensibility in the concha is very slight, and is usually only demonstrable on comparison with the unaffected side.

Dr. Mills, in closing the discussion, said the subject was a very difficult one to present in so brief a time as he had at his command. In the case reported by Dr. Hunt, which the speaker said he had read carefully, the herpetic eruption was clearly not in the distribution of the seventh nerve. This was proven by the very description of the case.

In one of his own cases, in which both the seventh and the acoustic nerves were cut, the severe pain from which the patient suffered prior to the operation was at once relieved and permanently, but the speaker said he did not attribute the relief to cutting those nerves, but rather to decompression.

Dr. Mills said he agreed with Dr. Hunt that the geniculate ganglion and the ganglia of the glossopharyngeal and vagus were the homologues of the spinal ganglia. He did not believe, however, that herpes could originate from the inflammation of a nerve which was not concerned with cutaneous sensibility.

TUMORS OF THE ACOUSTIC NERVE: THEIR SYMPTOMS AND SURGICAL TREATMENT, WITH REPORT OF A CASE OF COMPLETE RECOVERY

By Dr. M. Allen Starr

Tumors of the cerebellum, the author said, might be divided into two classes: those involving the hemispheres and the central portion, and those lying upon the base of the brain in the cerebellar pontine angle. While the diagnosis of a tumor within a mass of the cerebellum was not, as a rule, difficult, it was as yet almost impossible to locate exactly the position of such a tumor. Tumors of the acoustic nerve, on the other hand, which occurred with about equal frequency with tumors within the cerebellum, were much more readily recognized. In the early history of brain surgery, attempts at removal of tumors of the cerebellum so frequently failed, that

surgeons became reluctant to undertake this operation. Within the last five years, however, it had been necessary to alter this view, and with the improvement of technique there had been recorded a large number of successful cases of surgical interference in cerebellar tumors, and more particularly in tumors affecting the acoustic nerve. Year by year the percentage of recoveries has increased. In 1905, Frazier was able to collect the records of 116 cases of cerebellar tumor in which an operation had been undertaken. In 52 cases the tumor had been found at the operation; in 34 cases it had been removed successfully, and in 17 cases recovery from the operation and from many of the symptoms which had been present prior to the operation had occurred. Dr. Starr said he had been able to collect from the literature between January 1, 1905, and January 1, 1910, 128 cases in which an operation had been undertaken and in which the tumor had been found and removed. In 76 of these there was recovery of the patient and in 52 the patient died. By the term recovery it was intended to imply not merely survival of the patient for a few days after the operation, but relief from the symptoms present in greater or less degree for a period exceeding three months. It was true that some of these patients remained with imperfect sight or hearing, while others had remained somewhat ataxic in gait, or with partial paralysis of some one of the cranial nerves. On the other hand, a number had been reported as completely recovered after several months and even years, one case of Ballance having already survived the operation twelve years when the report was made. In one case described by Dr. Starr in detail in this paper he saw no reason for any doubt that the patient was permanently well, as she showed few if any symptoms at the end of eight months.

Such results certainly justified the operation, and made it evident that as experience grew and technique was perfected, the many dangers of the operation would be overcome, the operation would be undertaken earlier, and the percentage of recoveries would steadily increase.

In discussing the technique of the operation, Dr. Starr said he thought a bilateral operation, removing the bone from both sides of the cerebellum and then removing carefully the intermediate ridge of bone lying vertically between the two halves of the occipital lobe over the occipital sinus was necessary in order to give proper space for the displacement of the cerebellum to one side or the other during the operation, so that access might be had to the deeper parts in cases where the tumor lay in the pontine angle. Where only one side of the occipital bone was removed, the space opened was rarely more than two inches in diameter. Through this opening the cerebellum bulged greatly when there was a tumor within or beneath it, and thus the cerebellar tissue stood in the way of any access to the deeper parts.

Dr. Mills said he had seen a number of cases of tumor of the cerebellar pontile angle, and some of them had been subjected to a variety of operations. In most instances, the operation was not successful in the sense of the full recovery of the patient, although temporarily there may have been great improvement. The number of fatalities following these operations was considerable. In one of the most successful cases the patient was a woman who was operated on by Dr. John Gibbon, who succeeded in removing a tumor of the acoustic nerve. The patient was much improved, and survived the operation several months. In this

instance, the growth was probably of the pedunculated variety, springing from the embryonic tissue of the acoustic nerve.

Discussing the bilateral operation, Dr. Mills thought it was a very good method of procedure in perhaps the majority of cases, although his own experience with it was limited. It afforded the opportunity of pressing the cerebellum to one side or the other to get a better exposure, which was extremely important. The jamming of the cerebellum downward into the foramen magnum, by the pressure of the tumor, sometimes occurred in dealing with growths that were far removed from the cerebellum. Its possible occurrence should always be borne in mind in connection with the symptomatology of tumors of the brain. The speaker referred to one case in which a large part of one cerebellar hemisphere was sliced away. Following this, the optic neuritis from which the patient had suffered rapidly subsided, and complete recovery eventually occurred. One explanation of the effect of cutting away a part of the cerebellum was that greater space was given, thus preventing the continuous compression and irritative action of the tumor.

Dr. Dana said that personally he had never had a case of cerebellar tumor which had been operated on successfully, and he did not believe that statistics giving the number of tumors successfully removed were a fair index of the benefits of the operation. It would be more conclusive to know what percentage of those who were successfully operated on derived any comfort from the operation and were really improved. As it was, he had in mind some patients who were wretched objects in spite of the removal of the tumor, and in many cases he did not think it was necessary to resort to so radical a procedure. He referred to one case, a man about forty, who two years ago had a cerebellar tumor and was nearly blind and was suffering from intense headaches. After a simple decompression operation on one side by Dr. George D. Stewart, his eyesight improved and his headaches disappeared so that he was able to return to work for nearly a year. Recently his symptoms had recurred to some extent, although he was still able to walk about and did not suffer very much, and the speaker said he was inclined to believe that a second decompression operation would help him along for a few years more. In other words, decompression may be really sometimes better than absolute removal of a tumor.

Dr. George Woolsey said his experience with tumors of the cerebellar pontine angle had not been very encouraging. All his operations had been done more than five years ago and with the present technic the results were better. He had done three such operations, all by the unilateral method. In the first case, which was reported some time ago in a paper by Dr. Joseph Fraenkel and the president, Dr. Hunt, there was a tumor which was removed through a unilateral opening on the left side. The patient died twelve hours afterwards with symptoms indicating involvement of the cardiac and respiratory centers. In the second case, an attempt was made to do the operation in two stages. First, an opening was made through the bone, from the middle line out through the sigmoid groove well into the mastoid. The patient bore the operation very well, but within the next twenty-four hours, before the second stage of the operation was undertaken, he suddenly died. The cause of death in that case, Dr. Woolsey thought, was probably due to the jamming of the brain stem downward through the foramen magnum, and if that

possibility could have been foreseen, death might perhaps have been prevented by including the foramen in the removal of the bone as is now usually done. The third case was also done in two stages. There was very great intracranial pressure, so that the cerebellum bulged excessively through the opening and the tumor was reached with great difficulty. This patient did not survive the operation long.

Dr. Woolsey said that these cases had convinced him that in many instances the unilateral method of approach was not feasible without considerable laceration or removal of the cerebellum, and that the bilateral method, as described by Dr. Starr, was preferable, and this in itself was the best possible decompression operation, even if nothing further was done. While in some instances a tumor in the cerebellar pontine angle could be satisfactorily reached and removed through a unilateral opening, it could be better accomplished and with less risk to the patient, by the bilateral method.

Dr. Charles A. Elsberg said that since 1904 he had exposed the cerebellar pontine angle nine times, twice in search of a tumor of the auditory nerve which had been diagnosticated beforehand, and in several others where it was suspected. In the remaining cases the diagnosis was doubtful. In one instance where he attempted a unilateral operation in two stages, the patient died forty-eight hours after the first stage of the operation from uremia. About eighteen months ago, after a unilateral operation in two stages, he succeeded in removing a fibrosarcoma from the cerebellar pontine angle. This patient recovered from the immediate operation, but eight or nine weeks later she began to develop brain symptoms; these rapidly grew worse, and she died in two weeks. The post-mortem showed a second tumor lying in the middle fossa. In April, 1909, he operated on a patient who had been examined by a number of specialists. She had a facial palsy which was attributed to a cold. She was partially deaf, which was supposed to be due to an old ear trouble. She vomited, which was attributed to stomach trouble. Finally, she was sent to an ophthalmologist, who recognized a well-marked optic neuritis, and who was the first to diagnose the case as one of tumor of the brain. In this case a fibro-neuroma of the auditory nerve was removed by Dr. Elsberg through a unilateral exposure, the operation done in three stages. This patient made a good recovery from the operation. There was part improvement in her symptoms; she gained fifty pounds in weight. She still suffered from some ataxia and facial palsy, and from unilateral deafness.

In his subsequent operations, Dr. Elsberg said, he also confined himself to a unilateral exposure, but had modified his method of approach by removing the bone down into the foramen magnum and across the median line, so as to get the benefit of a slight dislocation of the upper lobe of the cerebellum, and well into the mastoid process. With such an exposure, even when the intra-cranial pressure was considerable, the cerebellum would fall away from the petrous portion of the temporal bone, and the operation could be completed with a minimum amount of shock and loss of blood. Care should be taken not to injure the pia mater. In all of his cases, with one exception, no injury has been done to the cerebellum.

By resorting to this free exposure on one side, going well into the mastoid process, Dr. Elsberg thought that a bilateral operation was un-

necessary in many cases, and if a tumor in this region could be safely removed through a unilateral opening without injuring the cerebellum, it was surely better than the bilateral operation. In several instances, the speaker said, he had sliced off considerable cerebellar tissue and had seen no harm to the patient result therefrom. In searching for tumors and abscesses in the posterior fossa, as well as in other regions of the brain, he had in quite a number of instances resorted to the exploratory brain puncture of Neisser, and on several occasions this procedure had proven of great value. In a number of cases the diagnosis was established by this means.

Dr. Ernest Sachs mentioned a case of tumor of the cerebellum which closely simulated an acoustic tumor. The patient was a girl of sixteen whose symptoms were those of general intra-cranial pressure. She suffered from headache and vomiting, and shortly before she entered the hospital became totally blind. On admission, in addition to these symptoms, there was complete deafness of the right ear, paralysis of the lower branch of the right facial and loss of sensation throughout the entire course of the fifth nerve on the right side. Both Dr. Sachs and Dr. I. Strauss, who saw the case with him, thought they had to deal with a tumor in the right cerebellar pontine angle. A bilateral operation was done and the foramen magnum was opened. Upon exposure it was found that the cerebellum was forced down through the foramen magnum, and reached almost to the top of the first cervical vertebra. A secondary operation was contemplated, but the patient died within twenty-four hours, of respiratory failure. The autopsy showed a tumor of the vermis which had pressed down on the pons to such a degree that it had destroyed almost completely the ascending root of the fifth, the facial and the acoustic portion of the eighth nerve.

Dr. W. R. Broughton, who had made the diagnosis from the eye findings in one of the cases reported by Dr. Starr, called attention to the rapidity with which the field for red and blue returned subsequent to the operation. The speaker said the patient had been referred to him in 1906 for headaches. At that time the fundi were normal. Two years later there was double choked disc. Under the iodide treatment there was marked improvement in the general health and the patient gained over thirty pounds in weight.

Periscope

Deutsche Zeitschrift für Nervenheilkunde

(Band 37. Heft 1 and 2. 1909)

1. Tetanus of the Head with Loss of Pupillary Reflexes. ORZECIOWSKI.
2. Study of the Central Nervous System in Mongolism. BIACH.
3. Further Contributions to the Symptomatology of Diseases of the Motor Nuclei. GOLDSTEIN and COHN.
4. Changes in the Spinal Ganglion in a Case of Landry's Paralysis. SCHWEIGER.
5. Importance of the Adductor Reflex. KELLER.
6. Contribution to the Myopathies. STEINERT.
7. Arrest of Development of the Skeleton in Anterior Poliomyelitis. KIENBÖCK.
8. Disease of the Central Nervous System in Degenerative Polyneuritis. HERZOG.
9. Hereditary Degeneration and Congenital Syphilis. DIEBALLA.
10. Temperature of the Skin in Health and in Nervous Diseases. CLAUS and BINGEL.

1. *Tetanus of the Head*.—Patient, æt. 47. No syphilitic history. Alcohol, 1 liter daily. Following a kick from a horse, which caught him on the left temple and on the breast, the patient developed one week later severe pains in the head. The lips were moved with difficulty, and finally he was unable to open right side of mouth. Two weeks later he developed convulsions and opisthotonus. The brain and spinal cord showed no gross changes. Microscopically the cranial nuclei were normal, save a few cells of the seventh on one side. Remainder of brain and cord showed no changes. Of especial interest was the Argyll Robertson pupil, and the disproportion between the clinical and pathological findings.

3. *Symptomatology of Disease of the Motor Nuclei*.—The writers report the clinical findings in six cases, indicating disease of the motor nuclei.

Case I. Patient, æt. 26, showed gradual increasing ptosis of right eye, and slight paresis of the right abducens. The absence of all other nervous symptoms caused the writers to believe this case one of isolated lesions of the third and sixth nuclei.

Case II. Patient, æt. 24, following an attack of erysipelas, developed weakness of the muscles of eye, together with weakness of the right side of tongue, palate and left side of face.

Case III. Showed involvement of the third, fourth, sixth, seventh, tenth, eleventh and twelfth, showing the picture of an acute polioencephalitis.

Case IV. Showed involvement of the right side of the seventh, eighth, eleventh and twelfth, following an attack of influenza.

Cases V and VI were syphilitic in origin and were somewhat similar.

4. *Landry's Paralysis*.—Reports an acute case, which pathologically showed besides an interstitial neuritis and hyperemia of the cord, also

interstitial and parenchymatous changes in the spinal ganglion. From the study of his case the ascending inflammatory nature of a polyneuritis could be demonstrated. The vagus nerve was extensively involved and caused the sudden death by respiratory failure. Bacteriological study of the spinal fluid was negative.

5. *Adductor Reflex*.—Keller studied this reflex in 100 cases of functional and organic nervous diseases. He found its presence or absence a valuable aid in the differentiation of normal and pathological conditions, and noted that as the disease process improved the reflex zone became smaller, and as the disease advanced this zone increased.

The reflex is elicited as follows: While the patient is lying down, the limbs are flexed and rotated slightly outward. The left hand is pressed over the upper insertion of the adductor magnus. The reflex is then obtained by tapping either in the popliteal space, the middle surface of the knee joint, or the inner condyle of the tibia, as well as over the tendons of the hamstrings and adductors. He concludes as follows: (1) The homolateral reflex acts analogous to the other tendon reflexes; (2) the pathological as well as the clinical value lies in the extent of the reflex zone rather than the strength of the muscular contraction. In those processes with lost or diminished reflexes this zone is lost or lessened, and in any case, not extending beyond the upper third of the tibia. In cases where there is an increase of reflexes, functional or organic, the reflex zone may reach as far as the middle surface of the foot; (3) the extent of the reflex zone of the adductor reflex is proportional to the general increase in the tendon reflexes; (4) the presence or absence of the adductor reflex as well as the extent of the reflex zone plays no relation to changes in the pyramidal tract, nor to the Babinski sign.

6. *Myopathy*.—From a study of his six cases of myotonia or Thomsen's disease, and a review of the literature, the writer indicates that a distinct disease occurs, even though a dystrophy is also added. The anatomical changes in one of his cases showed a widespread sclerosis of the muscles and a normal nervous system save for a true tabiform degeneration.

7. *Degenerative Polyneuritis*.—Report of two cases. The first studied clinically, the second clinically and pathologically. The changes found in the nervous system were of a degenerative character, and little if at all inflammatory. The changes in the peripheral nerves corresponded to a degenerative polyneuritis, while those in the spinal cord corresponded to a system degeneration, neither of which was the result of the other. The changes were primary, in functionally related neurones. Sometimes the degeneration affects only the peripheral processes, other times the central. The difference in localization depends upon the character of the poison.

8. *Hereditary Degeneration and Congenital Lucs*.—Reports a case in which patient was one of three out of twelve children alive. The other two also showed abnormalities. Patient, besides being feeble-minded, showed the following symptoms: inequality of the pupils, Robertson phenomenon, optic atrophy, absence of tendon reflexes, irregularly developed upper jaw and teeth of the upper jaw, also scoliosis and lordosis. The author discusses the differential diagnosis between tabes and congenital syphilis, and considers his case to belong to the class of hereditary degenerations in which syphilis played a rôle. The Wassermann reaction was positive.

A. LEOPOLD (Philadelphia).

Book Reviews

LA SUGGESTION ET SON RÔLE DANS LA VIE SOCIALE. Prof. W. Bechterew.
Traduit et adapté du russe par le Dr. P. Kereval. Paris, Ch.
Boulangé, 1910. Pp. 276, 4 fr.

This work discusses at some length the nature of suggestion and describes briefly a number of epidemics, some not usually mentioned in books of this character—the epidemics of Maliovanism, of Jehovism, the epidemics of Souponiéwo, of Novogroudsk, the Chinese uprising of the Sect of I-Ho-Kiüen (Boxers) and the Russian pneumatomaques (Doukhobores). The principal interest in this work is its indication of the versatility and remarkable productiveness of the gifted author.

WHITE.

SURGERY OF THE BRAIN AND SPINAL CORD. Prof. Fedor Krause, M.D.
Translated by Prof. Herman A. Haubold, M.D. Vol. I. New
York, Rebman Company. Pp. 282, 63 figures, and 24 colored
plates. \$6.00.

A large part of this volume is taken up with general questions of technique in matters of brain surgery. The several points are well illustrated by figures in the text while the colored plates, particularly those representing pathological conditions, are excellent. Aside from questions of technique the methods of operating for brain tumors, including decompression, brain abscess, and wounds are discussed. There is a good article on cranio-cerebral topography and the work closes with a consideration of lumbar puncture and radiography.

WHITE.

A TEXTBOOK OF MENTAL DISEASES. By Eugenio Tanzi, Professor of
Psychiatry in the Royal Institute of Higher Studies. Florence.
Translated by W. Ford Robertson, M.D., C.M., and T. C. Mackenzie,
M.D., F.R.C.P. London. Rebman Limited.

It is now some years since we reviewed in these columns Tanzi's treatise on mental diseases, and it is a matter of congratulation at this time that this, perhaps the most advanced work on psychiatry in Italy should be presented to English-speaking peoples. The psychiatric world is indebted to Drs. Robertson and Mackenzie for their labor of love, and to Messrs. Rebman & Co. for their courage in presenting in such an acceptable form a work of 800 pages on mental diseases by an Italian author. With the translations of Tanzi and Bianchi before us, and the recent masterly summary by Lugaro on "Modern Problems in Psychiatry," some of the chief features of the Italian school are now available.

In a word it may be expressed that Tanzi's tendencies are Kraepelian, in which respect he shows a marked contrast to the individualistic development of Bianchi. He accepts dementia præcox in the Kraepelian sense, although he is not ready to accept that author's manic depressive insanity. The paranoid dement is at times referred to paranoia, at

other times to dementia præcox. He maintains that paranoia is not a true mental malady, but a mental anomaly, and makes the very significant statement that "the asylum does not provide an environment suitable for the paranoiac; in his lucidity of mind he feels all the great distance that divides him intellectually from the insane." Perhaps Tanzi strains a point a trifle when he says "the alienist who takes no account of this incompatibility places himself beneath the level of the paranoiac." We ourselves feel that the paranoia bogey is much overdone, because the paranoid concept as handed down to us for many generations is really a concept of the paranoid dement of the dementia præcox group, and not the typical paranoiac in the strict sense. Tanzi's discussion of the paranoid problem, while lacking the breadth of view of Kraepelin's concept, is very forceful and practical.

We commend the chapter on asylums to the philanthropic worker, and particularly to the penologist, and to the worker in medico-legal problems. The asylum of a hundred years ago, which he characterizes as a public dumping ground, exists with us too much at the present day, but this is a fault, not of the physician, nor of the alienist, nor even of the public-spirited philanthropist, but of the niggardly politician who seeks for his graft, and neglects his social duties.

A generous reception should be accorded this volume by the alienists of this country, not only for its intrinsic merits, but as an encouragement to publishers to continue in such good works.

JELLIFFE.

THE ORIGIN OF VERTEBRATES. By Walter Holbrook Gaskell, M.A., M.D., L.L.D., F.R.S., University Lecturer in Physiology, Cambridge. New York, Bombay, Calcutta, London; Longmans, Green, and Co.

We call the attention of our readers to this work, particularly with reference to the extremely full discussion of the embryology of the nervous system in the vertebrates. Although not taking up the same ground as that covered by Held's work, it supplements it in many places.

Professor Gaskell's work, on the nervous system, has been well known for many years.

JELLIFFE.

THE MUTATION THEORY. EXPERIMENTS AND OBSERVATIONS ON THE ORIGIN OF SPECIES IN THE VEGETABLE KINGDOM. By Hugo de Vries, Professor of Botany at Amsterdam. Translated by Prof. J. B. Farmer and A. D. Darbishire. Vol. I, The Origin of Species by Mutation. Chicago. Open Court Publishing Company.

A few years ago a review of a translation of Hugo de Vries's work on mutation, particularly in the evening primrose, was presented to our readers. This is another volume, taking up the larger question of evolution and its relations to mutation. It is of value particularly to the botanist and the agriculturist, but also makes a special appeal to those interested in the general problems of heredity.

The general outlines of de Vries's hypothesis of mutation are too well known to be gone over again in this place. The present translation, by Professor Farmer and Dr. Darbishire, presents the entire argument in a thoroughly readable and attractive manner. We commend the Open Court Publishing Co. for their enterprise, and for the good piece of book work which they have given.

JELLIFFE.

DIE FUNKTIONEN DER NERVENCENTRA. Von Prof. Dr. W. v. Bechterew. Zweites Heft. Verlag von Gustav Fischer in Jena, 1909. Pp. 693 to 1336.

This is the second volume of Bechterew's monumental work on the nervous system and discusses the cerebellum, mid-brain, tween-brain and subcortical ganglia. The several subdivisions of the central nervous system treated of in this volume are profusely illustrated and the wealth of citations and amount and character of the information given in the text makes the work encyclopedic in its scope. It is easily the best work on the subject in any language.

WHITE.

LA PARALYSIE GÉNÉRALE. Par A. Joffroy, Professeur de clinique des maladies mentales, et Roger Mignot, Médecin en chef de la Maison Nationale de Charenton. Paris, Octave Doin et Fils. 1910.

General paresis is well recognized today as one of the most definite of the psychoses, and since the work of Bayle, as early as 1828, its clinical, pathological and etiological features have been gaining sharpness and definition.

There have been many monographs published in all languages, because probably no other mental affection lends itself so readily to monographic treatment. The present volume is one of the latest. It is one of a series of scientific encyclopedias, edited by Dr. Toulouse, and although not as complete as Obersteiner's revision of Krafft-Ebing's volume on general paresis, it presents in a readable, convenient and easy form practically all of the essential facts.

Although it is hardly to be expected in a work of this kind that it should be thoroughly up to date, we miss a number of important researches which no student of the problem of general paresis should have overlooked, more particularly from the pathological side the monumental work of Alzheimer, and the interesting work of Mott on the relations of trypanosomiasis to general paresis.

As an individual expression of views it is extremely interesting, and as convenient a monograph for reference it will claim attention, but it cannot be compared either from the standpoint of thoroughness or exactness with Obersteiner's work.

JELLIFFE.

Notes and News

WHARTON SINKLER, M.D.,

American neurology has suffered a great loss in the death of Dr. Wharton Sinkler on March 16, 1910. To the readers of this journal his name has been familiar for three decades, and for a longer period to the readers of other prominent medical journals in this country. His earliest neurological articles appeared a few years after his graduation from the Medical Department of the University of Pennsylvania in 1868. Respected and beloved by all with whom he came in contact, he was especially endeared to his colleagues of the American Neurological Association, of which he became a member in 1881, and of which he was the honored president in 1891. He took a continuous interest in the work of this national organization, to whose proceedings he was a frequent and valued contributor.

Dr. Sinkler's personality was peculiarly attractive. Without affectation or egotism, unostentatious but quietly enthusiastic in his work, he was always self-respecting and dignified. In the medical societies, like the American Neurological Association, the Philadelphia Neurological Society, the Section on Nervous and Mental Diseases of the American Medical Association, the College of Physicians of Philadelphia, and others in which he was long a commanding figure and in which he held positions of high honor, he was held in high regard by all his confrères. Considerate of others, careful of his facts, earnest in the positions taken by him, what he had to say was always listened to with attention and interest, and added especial value to the subjects discussed. He was a good comrade as well as a good colleague, and many pleasant hours spent in his company remain as hallowed memories with his former associates.

Dr. Sinkler may be properly regarded as a South Carolinian, although he was born in Philadelphia, August 7, 1845, at a time when his parents were on a visit to that city. He was a grandson of Thomas I. Wharton and a nephew of Dr. Francis Wharton, one of the authors of Wharton and Stillé's great work on medical jurisprudence, in the preparation of the fourth edition of which Dr. Sinkler played some part. In the preface to this edition it is stated that the sections from 265 to 586 were revised by him.

During the Civil War Dr. Sinkler served in the ranks of the Second South Carolina Cavalry.

To others the pleasant duty must fall of recording in detail the busy and honorable life of Dr. Sinkler. I can in this connection glance at only a few of its salient features.

I first met Dr. Sinkler and Dr. Weir Mitchell on the same day on the occasion of a visit to the outdoor service of the Orthopedic Hospital and Infirmary for Nervous Diseases of Philadelphia in 1870, shortly after my graduation from the Medical Department of the University of Pennsylvania. Beginning with his position as assistant to Dr. Mitchell



WHARTON SINKLER, M.D.

in 1870, Dr. Sinkler throughout his entire professional life had an active connection with the work of this hospital, which has attained such splendid proportions and has done so much to help suffering humanity and to advance the cause of neurological science.

The neurological contributions of Dr. Sinkler hold a high place in medical literature. Infantile and juvenile paralyses early attracted his attention, and now and then throughout his entire professional life he made important contributions on these subjects especially on anterior poliomyelitis, his first papers being published between 1874 and 1880. The profession owes much to him for his contributions on the functional and infectious nervous diseases, including chorea, migraine, hysteria, neurasthenia, etc. The phenomenon usually spoken of as the great toe reflex was first described by him in the *Medical News* for December 1, 1888. Chorea, like poliomyelitis, was a favorite subject with him, his papers including discussions of senile chorea, hereditary chorea, and the seasonal relations of this disease.

Dr. Sinkler was one of the earliest in this country to write at length on the subject of syringomyelia, and published the record of one of the first cases of this disease with autopsy. Many of his contributions were first presented at the meetings of the associations of which he was a member, or to medical societies in various parts of the country to which he was invited to present the results of his scientific studies and ripe experience. His last paper, which was on brachial neuritis, was read at the meeting of the Tri-State Medical Society at Richmond, Virginia, on February 18, 1910. During his return journey from this meeting his last illness began.

He was a highly valued contributor to some of the most important systems of medicine which have appeared in this country. Based upon his wide experience gained both in hospital and private practice, he contributed extensively to our knowledge of the rest treatment.

His interest in the subject of epilepsy showed itself not only in valuable contributions relating to this disease, but also in his active efforts in connection with special institutions for epileptics. In 1903 he was president of the National Association for the Study of Epilepsy and the Care and Treatment of Epileptics. The inception of the institution which is now known as the Pennsylvania Epileptic Hospital and Colony Farm, situated at Oakburn, Chester County, Pa., is due to Dr. Sinkler. I had constant opportunity to observe the noble work which he did in connection with this great charity, as my connection with it dated from its origin. First as one of its physicians, later as one of its trustees and president of its board of management, he from the beginning successfully exerted himself in its behalf. Most of the money which was secured for the purchase of the property, erection of buildings, and endowment for maintenance, was obtained through his energy and because of the great respect and regard in which he was held by those contributing. This institution is in itself a lasting monument to his zeal in behalf of humanity. He was a trustee of the Eastern Pennsylvania Institution for Feeble-minded and Epileptic at Spring City, Montgomery County, Pa., from the time of its opening.

Soon after his graduation, Dr. Sinkler was resident physician in the Episcopal Hospital of Philadelphia, later for many years one of its visiting staff, and still later until the time of his death one of its trustees. He was also a trustee of the University of Pennsylvania from the year 1905.

The positions of honor which his colleagues were pleased to bestow upon him were the offices of vice-president of the College of Physicians of Philadelphia, president of the Philadelphia Medical Club, and of the society of the Alumni of the Medical School of the University of Pennsylvania. Perhaps of no man could it be more truly said than of him that such honors came to him unsought.

He was not only identified with many of our most important medical associations, but was a member and official in a number of social organizations of the highest rank, as the society of St. Andrew, the Aztec Society, and the Southern Club of Philadelphia, of which he was the president.

The honor in which Dr. Sinkler was held in his own community was shown by the many evidences of mourning at his loss, by the throngs which attended the last rites at St. James's church, of which he was a vestryman, and by the meetings held and resolutions adopted in the numerous societies of which he was a member.

CHAS. K. MILLS.

The Journal OF Nervous and Mental Disease

Original Articles

ADDRESS TO THE AMERICAN NEUROLOGICAL ASSOCIATION¹

CEREBRAL LOCALIZATION FROM THE POINT OF VIEW OF FUNCTION AND SYMPTOMS

WITH SPECIAL REFERENCE TO VON MONAKOW'S THEORY OF DIASCHISIS

BY THE PRESIDENT, MORTON PRINCE, M.D.

It is a wise custom which permits your president to express his appreciation of the very high honor conferred upon him by an address rather than by a formal contribution to medical problems. It offers the opportunity, at least, to render a service which is capable of great value; that of reconsidering some of the problems which for the time being are thought to have been settled; of regarding them from new points of view and in the light of newly acquired data; of discussing new interpretations of the accepted formulæ of applied science suggested by the teachings of new knowledge.

And yet it is no easy task to rise to this opportunity notwithstanding the stimulus that comes from a desire to make a worthy return for honor conferred.

With much of what I have just said in mind I have chosen as a subject upon which to address you that of the doctrine of cerebral localization from the point of view of function and symptoms.

¹ Read at the thirty-sixth annual meeting of the American Neurological Association held in Washington, D. C., May 2, 3 and 4, 1910.

The doctrine of cerebral localization acquires a very different significance according to whether it means that the brain can be mapped out into a number of circumscribed areas in each of which can be located a definite psycho-physiological faculty or function; or whether it means only that these areas contain anatomical elements which are made use of for the physiological expression of a function; or that a given area is such an integral element of a functioning mechanism, widely distributed in the cortex, that an injury to the "center" not only destroys the element but throws the whole of this function out of commission by means of dynamic influences upon other areas and thus produces a group of symptoms.

From the point of view of science if the doctrine of cerebral localization is to be maintained as something more than a formula, it is of the utmost present interest and must become of utmost future utility to know what is localized. To put the question tersely the doctrine of cerebral localization resolves itself into the question whether the localization is of symptoms, or of function, or whether it is only an anatomical localization of fibers.

From the point of view too of applied science with increasing experience it is becoming evident that this question is of practical importance; for it too often happens that the formulæ of localization do not work in diagnosis. It not rarely happens that clinical and pathological findings are contradictory—contradictory not only of each other but of the accepted doctrine of cerebral localization. Thus not infrequently, on the one hand, extensive lesions in one or other of the recognized cortical centers run their course without symptoms and, on the other, focal symptoms, pointing to disease of these centers, develop in cases in which no anatomical alterations are found at the autopsy. These and other contradictions, which I shall presently refer to, need to be met in any satisfactory doctrine of localization.

Yet under the psychical force of an accepted doctrine such contradictions are passed by, perhaps deliberately put out of mind, in the satisfaction that the doctrine works in a sufficient number of cases to enable us to get along with it. In the light of these shortcomings it becomes evident that the interests of pure neurological science and applied science, so far at least as this doctrine is concerned, are common, for the accepted formulæ do not always work in practice.

It is related of Darwin, somewhere in his *Life and Letters*, I think, that he attributed his success to having methodically noted the exceptions which he met with to any accepted law. I think that the history of medical science shows that its errors have been too often due to a failure to note exceptions.

There is a growing dissatisfaction, I am convinced, with the currently accepted doctrine of cerebral localization, that is, in the form in which it is conventionally laid down. There is a feeling, occasionally expressed in print but more often privately entertained, that it is in many respects inadequate. This view, with one or two notable exceptions, is confined to criticism because of the difficulty in constructing a satisfactory theory which will meet the opposing facts.

Loeb, whose experimental work on the cortex of animals, particularly in regard to associative memories, is well worth recalling, insisted some years back that the various data at our disposal justified the interpretation of the "anatomical localization of fibres and not of psychic localization of functions." "It is obvious," he insisted, "that the assumption of a localization of *psychical* functions in the cortex is opposed to the elementary facts of associative-memory of consciousness." Loeb referred the loss of function following limited lesions of the cortex to dynamic influences exerted by the lesions upon distant but anatomically associated and widespread areas of the brain through shock-inhibition.

The first rude blow to the traditional localization of function in the cortex was received when Marie launched his attack on the currently accepted doctrine of aphasia. Whatever the outcome of the reinvestigation of this question shall prove to be, it is evident that the beautifully diagrammatic concepts of the function of language with which our text books were illustrated, and of the aphasic disturbances of this function in one or other of its many forms as produced by some particularly localized lesion, have been relegated to the scrap-heap of the phantasies of science. Our former naïve conception of aphasia can never be revived. As I heard one distinguished member of this society remark in discussion, the conventional doctrine of aphasia as formerly entertained was one which he often tried to find cases to illustrate for his students but which he found never fitted the cases. The fact, I believe, will be found to be that whether the

third left frontal convolution, the first and second left temporal convolutions and other areas take part in the function of language or not, the function as a whole, as a psychical process, is a widely distributed one in which are engaged many dynamic processes and anatomical "centers" and a lesion of any one of several "centers" may give rise to all modes of aphasic disturbance. It is mortifying, too, to realize, as I think we must, that the clinical pictures of aphasic disturbance as they have been developed by the traditional methods of examination have been naïvely superficial and have given only imperfect representations of the disturbance actually present. In a case very recently seen by me there were marked but moderate symptoms of word deafness and paraphasia, with an apparent clearness of intellect which deceived those in attendance. A sharper examination disclosed profound losses of memory and intellectual defects. I am sure that before the reopening of the aphasia problem I should have overlooked these widespread disturbances of function and fitted the clinical picture to conventional views.

The present doctrine of cerebral localization regarded as a mapping of the brain into areas within which lesions give rise to particular groups of symptoms is one of the triumphs of neurology which cannot be valued too highly. Regarded as a localization of the psycho-physiological functions represented by these symptoms within narrowly circumscribed areas it is in large part naïve to a degree which will excite the smiles of future neurologists. A rising change of mental attitude shows, that in some of its assumed narrow localizations of functions it bids fair to be classed with the phrenology of Gall.

These differences in the concepts of localization are rarely kept separate in the minds of writers. It would be interesting if time permitted to examine in detail the various concepts of function tacitly or explicitly assumed in the doctrine of localization in its present form. I can only briefly refer to one or two of them.

While incontestable evidence proves that hemianopsia results from lesion of the apex of the occipital lobe, there is still wanting the evidence that shows that we are justified in localizing a psychical function—that of the formation of visual images—in this area, much less that of localizing here the more complex function of visual perception and memories. There is not a

scintilla of real evidence that the hemiopic defect differs in any way from that following a lesion of an optic tract or of one half of the retina and is not simply a loss of anatomical conduction. It may be that to form visual images is the function of this area of the occipital cortex; but if so, the visual images must be but a simple and primitive element in a larger visual function which must pertain to more widely distributed areas; for associative visual memories are not lost in cortical hemianopsia. The hemiopic differs in this respect therefore from the aphasic in whom the lost images entail a corresponding amnesia for words and associative memories.

What I have said of the localization of the visual functions applies I believe with still more force to the localization of language. I say advisedly "localization of language" and not of the lesions giving rise to aphasia, because the evidence is becoming increasingly convincing that these are not identical problems and that one is not the converse of the other. I approach this question with diffidence, bearing in mind, as I do, the contradictory character of the evidence, the inherent difficulties which surround the acquisition of data in aphasics, upon which we must depend, and the great differences of opinion that exist amongst those few who by clinical, pathological and, I may add, psychological training are qualified to judge the question. The contest has centered largely round the question whether a lesion of Broca's convolution gives rise to the motor type of aphasia and, therefore, whether in this convolution can be localized so much of the function of language as is lost in this type. In thus stating the problem there is plainly a confusion of concepts—the one is a clinico-anatomical question involving a particular syndrome; the other a question of localization of function. In distinguishing between these concepts perhaps the difficulties may disappear, for a lesion might theoretically give rise indirectly to a group of language symptoms without being the seat of language function.

The clinico-anatomical data themselves are contradictory.

1. It appears to be unquestionable that, as demonstrated by recent reinvestigations of the question by Dejerine and others, lesions of F₃ do give rise to a clinical aphasic syndrome of the so-called motor type (Broca's aphasia). That is one fact—a clinico-anatomical fact.

2. It has been demonstrated that destruction of Broca's con-

volution may be accompanied by simple mutism—or pure motor aphasia of the so-called subcortical type (Ladame and von Monakow).

3. It also appears to be true that in a considerable proportion of cases of aphasia, characterized by loss of the power of word formation and articulation, Broca's convolution has been found to be intact. Indeed Dejerine himself, as strong an apostle as he is of the older conventional theory, cites a case of his own and Thomas's in which, with total aphasia, Broca's convolution was intact. It is also true that notwithstanding the fact that this convolution has been extensively or totally destroyed the aphasic disturbance of articulation which appears at the onset may disappear. If one desires particular cases as examples, I would cite as crucial evidence the case of Tuke and Frazer, reported as far back as 1872, and the more recent case of Campbell. In the latter case the complete aphasia so thoroughly cleared up that the patient exhibited no speech defect whatever during a period of twelve years up to the time of his death. It even may disappear rapidly as in the case of Bramwell, a fact difficult to reconcile with the theory of vicarious education of other areas.

Moutier,² in an elaborate exposition of Marie's views published the results of the post-mortem examination of 103 cases bearing upon the question of Broca's convolution, F3. Of these, in 27 this convolution was destroyed, yet *there was no aphasia*.

Conversely F3 was intact in 57 cases although aphasia had existed.

On the other hand in 19 the aphasia could be referred to a damaged F3.

Such discrepancies and contradictions von Monakow has strongly insisted upon. Indeed Dejerine has maintained that "in every lesion of the zone of language, whatever the seat of that lesion, every mode of language may be disturbed." It is not without interest to note in passing that Campbell previous to Marie's publication objected to the Broca convolution theory on the ground that this area does not contain cells of the motor type, but histologically is indifferentiable from his "intermediate pre-central" area in which he includes it. Brodmann also gives it a special type of cell by which he differentiates it from the motor area.

² L'aphasie de Broca.

In any theory of aphasia as a clinical syndrome and in any theory of function these discrepancies must be reconciled.

May it not be that a lesion in F3 may occasion a disturbance of language of the so-called motor type and yet this convolution not be an essential factor in the functioning mechanism of language?

Let us consider for a moment what the motor aphasic has lost and what we are seeking to localize in Broca's convolution.

(a) He has lost the action of articulation—a motor physiological mechanism.

(b) Then nearly all writers, excepting Marie and his followers, postulate a loss of "motor images of articulation" (Dérjaine), or "memory of articulations" (Ferrier), or "memory of movements" (Starr), or "motor memory-pictures" (Liepmann), or "kinesthetic memories" (Bastian), etc., and it is generally conceived that because of this loss of images or of memory, the loss of the articulatory act occurs. Let us examine these postulates a little more closely.

It is not always quite clear what is meant by these terms, but the generally intended meaning, I believe, is that motor images are equivalent to the complex sensory impressions streaming from the parts moved in speech into consciousness (Liepmann). These are substantially what used to be included under "muscular sense" and are caused *by* movement. As articulatory movements no longer occur these sensory impressions are, of course, no longer induced. But sensations resulting *from* movement and memory of movement are not the same thing and do not bear the same relation to movement.

It is extremely doubtful if we possess conscious memories of the feelings engendered by movement independent of the movements themselves, and, even if so, it is pure hypothesis that it is the loss of these memories that induces the loss of articulatory movements, or of any others. Such an hypothesis smacks more of metaphysical psychology (to which it must be confessed clinicians are extremely prone) than a warranted induction from facts. There is much physiological evidence to show that co-ordinated acts, like those of articulation, whatever their localization may be, are the resultant of a nexus of co-ordinated physiological motor innervations directly linked with sensory images and abstract ideas. So far as the clinical and physiological evi-

dence goes there is little to justify the assumption that pure motor localization is anything more than the localization of a physiological arrangement or mechanism for the innervation of movement.

I would also point out in passing that the evidence at hand shows that sensations of movement (muscular sensations) have their primary location not in Broca's convolution but in the central convolutions or more posteriorly. The location of the memories of these sensations in the former would require a representation of the sensations, which would be possible.

(c) But assuming that the motor aphasic has lost these hypothetical memories of articulation, distinct from sensations produced by articulation, this is not all he has lost, though the conventional text-book description would make it appear so. He has lost internal language. He has lost the power of voluntarily reproducing internal auditory and visual language. Internal language is a complex affair and our knowledge of it is vague, somewhat hypothetical and inadequate. But in it unquestionably take part, in varying proportions, auditory and visual word memories and weak articulatory movements with their sensory effects. The motor aphasic of the type of which I am speaking has lost all of these. Hence he does not know the language of what he wants to articulate. Though he understands language when spoken to—the words "horse" or "dog" or "watch," *i. e.*, retains the associative memories belonging to these sounds, he cannot voluntarily reproduce internally these auditory and visual word symbols. He has a particular type of language amnesia, namely, a loss of voluntary reproduction of auditory and visual language—a type of amnesic aphasia. Even the printed word will not recall this memory, for often he is unable to read. He cannot construct words out of alphabet blocks, a function which does not require the use of hypothetical graphic centers, nor of articulation. Our knowledge of the mental condition of motor aphasics, indeed of all aphasics, is very crude, for the difficulties in determining it are great; but that they have lost voluntary memory of language is brought out clearly as recovery takes place. Thus it may be that after articulation has been recovered they seek in vain for the word desired until it is spoken to them when they remember and can articulate it. This is well known in the case of Tuke and Frazer already referred to. In this

case there was total destruction of Broca's convolution and the lower portion of the central convolutions to which the lesion was limited. Wernicke's region was intact. At first there was complete speechlessness. Later articulation returned but there persisted "a hesitancy when about to name anything" due to an inability to recall the name. Towards the time of her death, fifteen years after the seizure, "she could not recall even the simplest terms and periphrases and gestures were used to indicate her meaning. If the words were given her she invariably repeated them. For example, she would say, 'Give me a glass of ——.' If asked if it was 'water?' she said 'No'; 'wine?' 'No'; 'whiskey?' 'Yes, whiskey.' *Never did she hesitate to articulate the word when she heard it.*" The memories of the words were conserved, but their voluntary reproduction was lost.

This complex disturbance of function is well brought out by contrasting this Broca's type of the motor aphasic syndrome with that other type, the so-called "pure motor" aphasia—the subcortical of Wernicke, Lichtheim and Dejerine, the "anarthria" of Marie (meaning thereby not the paralytic defect of other writers). Here there is the same loss of the power of articulation but the disturbance of function is much less. Though this aphasic may not be able to utter a word, he knows what he wants to say, and there is no loss of the power of reproducing auditory or visual word images and all their associative memories. He can read and write for he has retained internal language but cannot articulate it. He is merely a mute. These facts show that the aphasic loss of articulation does not necessarily involve loss of auditory and visual word memories and internal language, nor necessarily depend upon loss of motor memories. The contrast of the two types shows the larger disturbance of function in Broca's type. I may at this point call attention to the fact that in one of the most exhaustively studied cases of "pure motor" aphasia, or mutism, from an anatomic point of view (that of Ladame and von Monakow) the lesion was not subcortical but of Broca's convolution which was totally destroyed. So that it may be taken as a clinical fact that a lesion of this convolution may be accompanied either by Broca's motor aphasia or mutism of the so-called subcortical type.

The amnesia of motor aphasics will well explain that commonly present symptom which has been so puzzling to the local-

izationist—agraphia. It is not necessary to assume the intervention of a lesion of a graphic center for, obviously, a person cannot write if he does not remember the words he wishes to write. His mental condition is much the same as that of a person who temporarily cannot recall and therefore write a word in a foreign language which he "knows," or who has forgotten the meaning of a word which he sees.

The recognition of this peculiar amnesic quality of Broca's motor aphasia, that is, of internal language, is, I think, strange as it may seem, generally passed by or overlooked by writers of text-books and of much of the periodical literature. Von Monakow, as might be expected from his comprehensive grasp of the subject, fully describes it and it enters into Marie's conception of Broca's aphasia as a clinical syndrome. Indeed it is this characteristic of Broca's aphasia which lends considerable weight to Marie's conception of aphasia as a clinical syndrome apart from his views of anatomical localization. What he recognizes clearly is that in Broca's aphasia, over and above the mutism or articulatory defect—the so-called "pure" type—there is something more added. This something more, however, conceived of as a vague intellectual defect, seems to me confused and insufficient in an exposition of the mechanism of language.

If these statements be correct the lesion in Broca's convolution that causes motor aphasia induces a much more complex disturbance of function than a loss of articulation and of memory of sensations of movement. The most enthusiastic localizer, any more than Marie, would not hazard the localization of the auditory and visual symbols of language involved in internal speech in Broca's convolution, but if he did disregard them as inconvenient facts would attribute their abolition in motor aphasia to secondary dynamic or other influences.

In this classical example of cerebral localization—Broca's aphasia in the third frontal convolution—we have a capital illustration of the great difference between the localization of a clinical syndrome and of function in a particular center. A lesion in this center may produce the Broca syndrome but the disturbances of function extend far beyond what can be localized therein. At most but a part of that syndrome, the motor articulatory process and hypothetical motor images, can possibly be assigned to Broca's convolution. May it not equally well be,

considering the contradictions I have cited—the incontestable occurrence of Broca's aphasia without lesion of F3 and this same with lesion of F3—that even the motor defects which clinically are found to follow destruction of F3 may, as Goltz and Loeb insisted, be due to such influences upon other areas? This question von Monakow, to whom we are indebted for reopening the problem of localization, undertakes to answer in the affirmative.³

I have entered at this length into an analysis of cortical motor aphasia not for the purpose of discussing the larger problem of aphasia, but because it exemplifies the clinico-pathological contradictions that are met with in practice and the differences in the concepts of syndromes and of function as contained in the current doctrines of cerebral localization. If time permitted other syndromes and functions might have been taken for analysis—astereognosis, asymbolia, apraxia, motor and sensory defects, etc., and their corresponding functions. Similar contradictions and differences would, I believe, be found. Extraordinary as it seems even motor centers have been found to be destroyed without resulting paralytic defect (Tuke and Frazer, Ladame and von Monakow). Such discrepancies point to the need of the study of function in the interests both of neurological science and of applied science.

Von Monakow,⁴ whose clinical experience and pathological training entitles his views to great weight, points out the inadequacy of the generally accepted doctrine of localization, to account for the contradictory phenomena to some of which I have already referred. Among others, he insists, is the very different course of the symptoms in individual cases though resulting from lesions which are similar in locality and in the nature of the pathological process; thus with persistence of the lesion under, in other respects, similar pathological conditions, the local symptoms in one case rapidly regress, in another, on the contrary, progressively develop or periodically manifest exacerbations with later improvements. In such cases the autopsy fur-

³ Observation d'aphémie Pure, Ladame and von Monakow, *L'Encéphale*, March, 1908.

⁴ Neue Gesichtspunkte in der Frage nach der Lokalisation im Grosshirn (*Correspondenzblatt für Schweizer Aerzte*, 1909, Nr. 12), from which the following exposition of von Monakow's views is taken. See also, Über den Gegenwärtigen stand der Frage nach der Lokalisation im Grosshirn, 1907, by the same author; and, Observation d'Aphémie Pure, Ladame and von Monakow; *L'Encéphale*, March, 1908.

nishes no satisfactory explanation. Indeed, in human beings, at least, we do not know what is the minimum of local symptoms and their duration that must result under all conditions from a limited focal lesion. This is especially true of aphasia, apraxia, asymbolia, mind-blindness, but also of many coarser half-sided disturbances such as hemianopsia, hemiataxia, hemianesthesia, etc.

From these and other considerations von Monakow has been led to feel, as must every unprejudiced investigator, that there lies some error in the form in which localization is conceived by most clinicians. Today, he significantly remarks, the principal opponents of localization have been silenced or become extinct, but thereby the numerous contradictions in the doctrine have not been eliminated.

Today, as formerly, two sets of experience stand opposed to one another, the negative and the positive, and invite anew discussion of the doctrine of localization which has been declared closed by many writers. We must ask ourselves once more the question: How are the contradictions to be explained?

To answer this question von Monakow proposes a theory which is of the greatest interest and considering the qualifications of the author challenges examination. Accepting like Loeb the concept that a cerebral function cannot be localized in that it is the expression of a mechanism involving the coöperation of widely separated anatomical areas in the cerebrospinal system; and, therefore, that a limited focal lesion cannot through loss of substance alone destroy the whole function but only certain elements thereof; and also like Loeb maintaining that the disturbances of function following cerebral lesions are in large part due to the dynamic influences exerted by the focal lesion on associated but distant areas—von Monakow, starting from this view point has worked out a theoretical mechanism by which the dynamic influences proceeding from a lesion disturb the function as a whole and produce the symptom-complex usually ascribed to and localized in a single focus of brain area. This theory is called that of *diaschisis*.

As this theory has not, I believe, received the attention it deserves, I may be permitted to sketch briefly its main features.

Von Monakow falls back upon the results of experimental investigations for a key to the riddle of localization. As every

one knows, of the physiological disturbance following extirpation of focal areas of the cortex in animals, some—the initial symptoms—are only temporary while others—the local symptoms—are residual or persistent. Only a small portion of the symptoms are a *necessary* result of the anatomical solution of continuity and therefore *in principle* permanent. The remainder can disappear and therefore *in principle* are temporary. But though in principle temporary, nevertheless they may, in fact, persist indefinitely for reasons which I will presently give.

The residual symptoms alone represent the function or parts of a function that is localizable in a given center.

Thus far these have been ascertained in man for only a small part of the cortex. It is interesting to know that amongst the residual symptoms von Monakow counts hemiataxia following lesions of the anterior central and astereognosis following those of the posterior central convolution; hemianopsia from the visual sphere; turning of the head and eyes towards the direction of the sensory irritation from lesions of the visual sphere, and pre-central gyrus, etc.

Among the temporary symptoms he would place above all others those which have a higher dignity, as, for example, those of more intellectual orientation in space, aphasia, apraxic and asymbolic disturbances. Then again individual quite coarse symptoms which are *superimposed* upon the above mentioned residual symptoms are reckoned as temporary in principle. It is rather surprising to learn that flaccid hemiplegia and *total* hemianesthesia are considered not as permanent symptoms and due to loss of substance but as examples of such superimposed temporary symptoms, and as having place of origin in subcortical regions (thalamus, mid-brain, oblongata, spinal cord). This is explained by the dynamic influences to be presently described.

I would here point out that even if the diaschisis theory be correct, it is not necessary to accept this classification of individual symptoms in its entirety. Indeed the interpretation as given of some of the symptoms just mentioned may well be doubted. However that may be the main point is: How are we to explain the occurrence of the, in principle, temporary symptoms including those superimposed upon the residual symptoms?

According to the diaschisis theory, so-called focal symptoms are in large part a complicated *reaction* of unimpaired areas of

the central nervous system to the local cortical lesions; a function, on the other hand, involves the participation of physiologically differentiated elements which are parts of a large mechanism, entrusted with the function and distributed through the entire nervous system. The localization of the symptoms and of a function therefore are two different things: the one is of a reaction, the other of a mechanism.

The manifestation of the reaction of the nervous system to a localized lesion may be thought of as the consequence of two factors:

(a) Anatomic or physiologic gaps in the continuity of fibers resulting from the lesion. These gaps may be occasioned by the loss of substance of the anatomic centers, or by dynamic physiologic loss at the point of contact of the centers with the rest of the mechanism—points which are essential for the performance of the function.

(b) Factors which pertain to the nature and mode of action of the pathologic process (circulatory disturbances, edema, compression, filling of the ventricles, toxic influences, etc.). Although these pathologic factors play a part in the symptom picture, they are not sufficient to account for the peculiar behavior of localizing symptoms for various reasons; particularly because severe focal symptoms can appear and persist during a long period of time without the presence of any of the above mentioned pathologic factors.

We are consequently obliged to fall back upon dynamic factors. Von Monakow here approaches the older conception of Goltz somewhat modified to explain the *temporary* symptoms. With Loeb he holds that these symptoms are due to the shock produced by the lesion upon other anatomically related areas by means of association fibres. Goltz supposed an active inhibition of such areas to account for temporary symptoms; von Monakow with Loeb supposes a passive paralysis from shock. The distinction does not seem to me clear or important. He does not however deny with Goltz localization of function in the cortex but only substitutes a different mechanism for that of the conventional doctrine.

As to residual symptoms he is in accord with Munk. He thus takes a position half-way between the two parties and bases

his conviction upon a careful study of the literature and numerous personal classical, experimental and anatomic observations.

By *diaschisis* is meant a functional shock-like inhibition of previously uninjured distant areas produced by the dynamic influences of a lesion anatomically connected with such areas. Through the break in the continuity of the conducting associative paths the eccentrically lying brain foci are robbed of their natural sources of stimulation and in part isolated. Thus temporary symptoms, in principle, may persist indefinitely from persistence of inhibition.

As projection, associative and commissural fibers are broken by every large lesion, so this isolation falls within the fields of all three classes of fibers, which differently combined, according to the location of the lesion, inflicts these deleterious effects at their end stations in the gray matter.

We can therefore speak theoretically of associative and cortico-spinal diaschisis. In all these cases—and this is an important point—the functional injury is not limited to the neurones which are directly connected with the lesions, but becomes extended or relayed, so to speak, to more distant complexes of neurones which are indirectly linked and physiologically united with the lesion.

Only the directly injured elements gives rise to the permanent symptoms and secondary degenerations; the indirectly injured neurones are the proper carriers of diaschisis. The shock-like influence is in principle temporary as is the nature of shock.

It is unnecessary for me to pursue this theory in detail or illustrate it before this audience by special cases. Each one can easily see its theoretical applications. I ought however to emphasize the fact that anatomical localization is in no way denied or abridged. It is only the mechanism of function and of the symptoms that is concerned. The conventional cortical centers as at present conceived are symptom producing centers and not centers of functions as conventionally ascribed to them. The theory in detail is revolutionary however of certain accepted views of the function of certain areas. For instance, according to von Monakow's interpretation of clinical and pathological findings "the sole necessary residual result of a radical destruction of the anterior central convolution is a hemi-ataxia with light contracture—a disarrangement which still permits of a reduced

use of the arm and leg. Paralysis would seem from von Monakow's view to be the effect of diaschisis upon the spinal centers.

This and other interpretations of particular symptoms does not seem however to be essential to the theory. If the theory be correct the interpretation of individual symptoms can await future investigation.

Several questions remain to be asked: Is the diaschisis theory the true solution of the discrepancies in the current doctrine of cerebral localization? How far does it give an insight into the mechanism of cerebral function? How far does it explain the discrepancies in clinical and pathological facts and, How far is it supported and how far contradicted by established facts of observation?

It is too soon to give definite answers to such questions. The theory needs to be examined in connection with new cases and a large series of cases needs to be studied in relation to their bearing on the theory.

We may, however, give partial or provisional answers to some of these questions.

1. So far as the theory definitely distinguishes between the localization of symptoms and the localization of function I think it may be safely insisted upon as the only interpretation that can reconcile the facts of clinical and pathological observation and comparative physiology. Although this differentiation is the basis of the diaschisis theory it is not original with it as it had long since been insisted upon by that brilliant physiologist, Loeb, as a conclusion from his experimental studies on animals.

2. So far as the theory insists on the dynamic influence exerted by focal lesions on widely separated areas, thereby producing disturbances of function and symptoms by some sort of inhibition, it must also be accepted as established by a long series of well-known clinical, pathological and physiological observations. In a general way this principle and the isolated occurrence of such disturbance in special cases have been long recognized. Loeb systematized as a principle the dynamic factor in the mechanism of function, and in the disturbance of that mechanism, in his published views of brain physiology. Even Dejerine, uncompromising localizer as he is of the various modes of the

function of language, admits, as we have seen, that "in every lesion of the zone of language whatever may be the seat of that lesion all the modes of language are affected."⁵ "If we follow," he adds, "an aphasic from the onset of the seizure it is very exceptional not to observe an amelioration of the symptoms of the onset; of these some, as we know, are the consequence of functional disturbances caused by the influence of the injured center exercised upon other centers of language and due to that which we call shock, or inhibition, or action at a distance."⁶

To admit this is to accept the diaschisis theory in principle. It would only remain to determine what elements of function are localized and what symptoms are *necessarily* produced by given focal lesions; we know fairly well what symptom groups may be, but not what necessarily are, produced by a large number of such lesions.

3. It is here in the domain of cerebral physiology and special pathology that von Monakow's work is of special significance and importance and originality. He has offered an entirely new conception of the relation of the so-called cortical centers to the functions which they are supposed to subserve and to the special symptoms which are observed to follow their destruction. In aphasia, asymbolia, apraxia, cortical paralysis, for example, he has sought to determine the exact element of function localizable in given areas and therefore the *necessary* symptom defect following a focal lesion. Finally he has sought the exact diaschisic effect responsible through associative, commissural and other paths, for the remainder of the symptoms. He would be the last to claim that he had solved all the many problems involved in cerebral localization, in fact he has insisted that the final determination of the details of the special physiology and pathology must await future investigation.

In conclusion, I would point out that the diaschisis theory is fruitful in other fields than that of cerebral localization. Its various possible applications in the explanation of focal symptoms without focal lesions will occur to everyone. As an example I may mention the puzzling paralysis which sometimes follows epileptic seizures. I recall vividly, too, in this connection a condition of complete mutism—so-called pure motor aphasia—

⁵ *Sémiologie du système nerveux.*

⁶ *L'aphasie motrice, L'Encéphale*, May 25, 1907.

which regularly followed the attacks in an epileptic who had some years previously received an injury to his head. There was no agraphia or word deafness. Such defects might well be explained by diaschisis from a distant lesion. The very fruitfulness of the theory appeals to the imagination and recalls the words of Goethe: "Was fruchtbar ist, das allein ist wahr."

THE SENSORY FUNCTIONS ATTRIBUTED TO THE SEVENTH NERVE

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(Continued from p. 284.)

THE SEVENTH NERVE AND COMMON SENSIBILITY IN THE TONGUE

One region to which nerves concerned with some forms of common sensibility have been supposed to be distributed through the chorda tympani is the anterior portion of the tongue, but personal observations, especially some of those made in cases of peripheral facial paralysis, are mainly in opposition to this view.

"After a trigeminal neurectomy," says Cushing, "that portion of the tongue anterior to the circumvallate papillæ is an exception to the rule of total anesthesia to all forms of stimuli. Simple tactual impulses produced with a horse hair, as well as those of pain and temperature, are completely interrupted exactly to the mid line. Certain forms of common sensation are, however, preserved. If a cotton swab or a wisp of cotton be moved over the anesthetic field, its presence is recognized, localized more or less accurately, and its direction of movement appreciated. There are reasons for believing that certain fibers from this area of the tongue not only as the special sense fibers of taste but also of common sensation, pass to the brain by way of the chorda tympani and the nervus intermedius (Wrisberg). . . . In none of these cases was taste affected in the slightest by the operation; in all of them there was retained over the anesthetic portion of the tongue this peculiar form of sensitiveness to certain tactual stimuli. An examination, furthermore, of a number of cases of facial palsy, has shown that when the lesion is high enough to interrupt the transmission of gustatory impulses there is an accompanying slight sensory disturbance over the anterior por-

tion of the tongue to these particular forms of stimuli, even though a normal sentiency to touch, pain and temperature seems to be present. Thirdly, the good fortune of being enabled to observe a patient in whom both the fifth and seventh nerves were totally paralyzed has shown that no sensation whatever over the anterior part of the tongue remained to touch, taste, pain, temperature or to the movement of the swab over the surface. These observations have been sufficient to establish from a clinical basis a personal conviction that there exist afferent fibers of two sorts, common and special sense fibers, which pass from the tongue via the chorda tympani and N. intermedius. It may be seen that morphological studies are in agreement with this."

I have already indicated when speaking of the pressure sense that the sensation apparently present in the tongue in Cushing's trigeminal cases might perhaps be explained by the movement communicated to this organ in drawing the swab or other object over it. Nevertheless in the light of his well-observed cases Cushing's view as to the anterior portion of the tongue being supplied in part with sensibility through the seventh must be given much consideration.

Three of the ten cases of peripheral facial paralysis studied by me showed some apparent change in sensibility. In two of these cases the hypesthesia was to be classed as due to suggestion, to belong in other words in the domain of hysterical hypesthesia. These were the same cases which showed a hypesthesia or apparent hypesthesia all over the face and the auricular region. This question of hypesthesia suggested by the presence of a motor paralysis must always be borne in mind in studying cases of facial paralysis for impairment of sensation.

In a third case, a man who was admitted to the hospital in a state of alcoholic stupor, the examination for sensation was made immediately after he had come out of this condition and when his mind was becoming alert. Testing the tongue with light touches to the right and left of the median line, in a ratio of four times out of five he said that he felt the touches more on the left than on the right or paralyzed side, while in testing for pain he responded that this was the same on both sides.

With regard to the condition of the tongue in the three trigeminal cases examined, the results were as follows: In one case in which an old complete section of the third branch of the

fifth had been made, there was no sensation on the right (operated) side of the tongue to the hair test. The sensation to pain and temperature was reduced, not absent. In other cases where the third branch had been completely divided, sensation was entirely lost on the operated side.

The following note from Dr. George B. Wood, of Philadelphia, reporting the effect on the tongue of cocainization of the chorda tympani in the tympanic cavity, is of interest in connection with the discussion of this question.

"In an intelligent patient, a woman about twenty-five, a suppurative condition of the ear had destroyed the scutum so that one could see directly into the attic of the tympanum containing the bodies of the malleus and incus and other important structures. The drum itself was practically normal. On cocainizing the attic for the purpose of treatment, the patient complained of numbness on that side of the tongue, and on testing with a pin the sensation on the right anterior half of the tongue was apparently entirely lost, the remaining part of the tongue being normally sensitive. The explanation, of course, is that the chorda tympani nerve in its passage through the tympanic cavity became anesthetized from the cocain. Sensation returned to the tongue as soon as the anesthetic wore away."

THE VIEWS OF HUNT AS TO THE FUNCTIONS OF THE GENICULATE GANGLION SYSTEM

According to Hunt a strip of the external auditory canal and a portion of the concha, helix and antihelix have their sensory innervation (epicritic and protopathic) through the intermediary nerve of Wrisberg and geniculate ganglion. Three or four valuable papers by this author deal with facial (seventh nerve) paralysis associated with herpes of the cephalic extremity. A fourth paper is concerned with the subject of otalgia, particularly with reference to the part played by the geniculate ganglion and its branches in this affection.

Hunt's main contentions may be summarized as follows: (1) The geniculate ganglion and its proximal and distal branches are parts of an epicritic and protopathic sensory system, the geniculate ganglion being the homologue of the dorsal spinal ganglia and the area of distribution of sensation being as just

stated, in the external auditory canal, concha, helix, etc. (2) The geniculate ganglion plays only a very minor rôle as the ganglionic center of an afferent gustatory system, Hunt's exact words being, "Save for an uncertain relation to the taste fibers of the chorda tympani the sensory mechanism of the facial has played no rôle in symptomatology, and has not had attached to it any definite sensory functions." (3) The geniculate ganglion is at times the seat of "herpetic" inflammation, with an eruption of herpes in an auricular cutaneous strip, the syndrome in some of these cases of geniculate posterior poliomyelitis being facial paralysis with herpes, in others facial paralysis with impairment of hearing or other acoustic phenomena and herpes. (4) Besides the herpetic eruption referable to lesion of the geniculate ganglion, herpes due to posterior poliomyelitis of other ganglia as of the cervical, the petrous, the jugular, and the gasserian, is sometimes associated with facial paralysis or with facial paralysis and auditory symptoms. (5) Otalgia, either idiopathic or reflex, is often to be referred to lesion or disturbance of the geniculate ganglion.

Hunt supports his position by reference to the embryological work of His and others, to some cases of neurectomy of both the fifth and the seventh nerves, and to a study of the various paralytic herpetic syndromes of the cephalic extremity.

THE GENICULATE SYSTEM AND THE SENSE OF TASTE— EMBRYOLOGICAL TEACHINGS

In order that the views of Hunt receive acceptance one must be able to demonstrate in the first place, that the geniculate ganglion, as has been hitherto maintained by many competent observers, with its branches and central root, is not given over to the sense of taste.

One can admit with Hunt the homology between the dorsal spinal ganglia and the cranial ganglia—gasserian, petrous, jugular, and geniculate—without acknowledging that the functions of these ganglionic systems are the same as those of the spinal ganglia with their afferent nerves.

Let us now turn to this question of homologies as indicated by embryology. In the process of evolution the geniculate ganglion, and to a large extent in all probability the petrous

ganglion, has become transferred in its functions to the sense of taste. Possibly some vestigial cutaneous afferent fibers may be present in the geniculate system, but this is all that with the evidence can be asserted.

Dixon, for instance, holds that in fishes and in lower air-breathing vertebrates the palatine and prespiracular nerves take origin together from the ganglion which is the homologue of the geniculate ganglion in man, while the post-spiracular on the other hand corresponds to the efferent motor facial. He shows

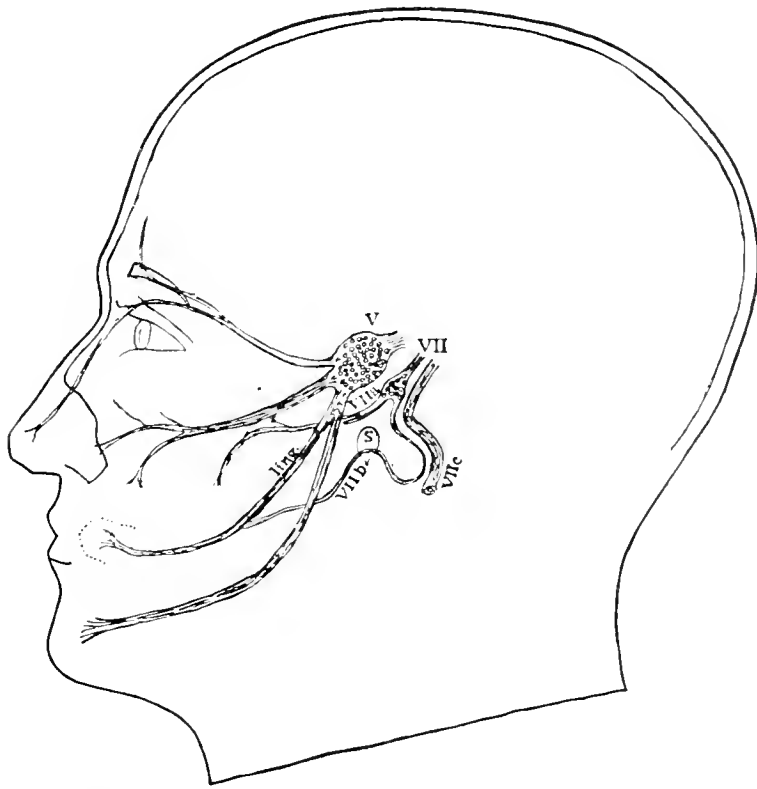


FIG. 1. Diagram to illustrate the sensory distribution of the facial nerve in man (Dixon). The sensory functions of the seventh nerve as here indicated are gustatory. The great superficial petrosal nerve (VIIa) is a nerve of taste from the soft palate to the geniculate ganglion. The chorda tympani nerve (VIIb) is the nerve of taste from the anterior two thirds of the tongue, except its tip, to the geniculate ganglion. The motor facial is indicated by VIIc. The gasserian ganglion and the three branches of the fifth are shown in the diagram.

that the great superficial petrosal nerve in man corresponds to the palatine, and the chorda tympani to the prespiracular, these nerves both in lower animals and in man going to regions which are especially concerned with the function of taste. The limits of this article will not permit a discussion of the details on which

these opinions are founded, but they certainly agree better with the idea of the gustatory functions of the chorda tympani and great superficial petrosal than with that which would make these nerve branches largely concerned with sensation in the skin and mucous membrane.

In most of the discussions of the question of the existence of areas in which common sensibility or the sense of taste has been referred to the seventh nerve, the great and small superficial petrosal nerves, especially the former, have played a considerable part. These nerves run between the geniculate ganglion and the sphenopalatine and the otic ganglion which are generally regarded as belonging to the fifth nerve.

It will not be necessary to recall here the well-known description of the course of the great superficial petrosal after it leaves the geniculate ganglion. It is sufficient to say that in a certain part of its course it joins with the great deep petrosal nerve to form the vidian, through which its course is to Meckel's ganglion. One of the descending branches of Meckel's ganglion is the posterior or small palatine nerve which is distributed to the soft palate.

According to some physiologists the great superficial petrosal is an afferent nerve with sensory functions; according to others it is motor; while others regard its trunk as conveying both afferent and efferent fibers. By some its afferent functions are held to be gustatory; by others sensory in the ordinarily accepted cutaneous meaning of the word. Even those who have regarded the great superficial petrosal as a part of the gustatory pathway have differed with respect to the direction in which the impulses concerned with taste travel in the nerve.

Presumably if the great superficial petrosal is an afferent nerve, the anatomico-physiological pathway would be from one of the branches of Meckel's ganglion, the posterior palatine for instance, to this ganglion and thence by way of the vidian to the great superficial petrosal, the geniculate ganglion, and the pars intermedia to the nuclear terminus of this nerve. If this view be accepted the great superficial petrosal nerve can take no part in auricular cutaneous sensation or otitic herpes.

Returning now to the question of homologies, arguments based on these, especially when such reasoning derives its chief strength from embryological and histological studies, are of great

value, if the facts are properly interpreted. Dixon on his part and Hunt on his, both use such arguments, and yet arrive at quite different conclusions with regard to the geniculate ganglion. In the case of the jugular and petrous ganglia it is probable that some of the afferent fibers and roots springing from these bodies are concerned with the common sensibility (cutaneous sensibility, epicritic and protopathic). In the case of the petrous ganglion a large portion of the cells of this ganglion are regarded with little opposition as having gustatory functions, the root fibers going to the glossopharyngeal nucleus or a part of it, and the peripheral fibers to the back part of the tongue and other buccal surfaces. In the case of the ganglion of Scarpa on the vestibular nerve, and the spiral ganglion of the cochlear nerve, the afferent systems of fibers are concerned with equilibration and orientation and with hearing, not with cutaneous or membranous sensibility. The geniculate ganglion has for the termination of its root, the *pars intermedia*, the upper part of the nucleus of the glossopharyngeal, and for its peripheral portions the chorda tympani and the great superficial petrosal nerves, and the weight of the evidence is entirely in favor of this afferent system being concerned with the function of taste.

It must be remembered here that only those fibers, probably vestigial if they exist at all, which are concerned with the innervation of cutaneous surfaces, would be likely to be involved in a disease with cutaneous manifestations.

Similarly the ganglion of Scarpa and the spiral ganglion of the cochlear nerve, while they may be homologous with the spinal ganglia, are concerned with non-cutaneous functions, and can take no part in a cutaneous disease. Hunt is right when he says that these ganglia may all take part in an infectious inflammatory disease which in the case of the spinal, gasserian and other ganglia gives rise to herpes. The results of such disease would not, however, be an herpetic eruption, but in the case of the geniculate ganglion would rather be a syndrome mainly gustatory, in that of the ganglion of Scarpa symptoms mainly of equilibration and orientation, and in that of the ganglion of Corti acoustic phenomena.

SURGICAL OBSERVATIONS REGARDING THE COURSE OF THE
NERVES OF TASTE

In the cases of section of the fifth nerve studied by me with regard to the loss or preservation of taste, the evidence is opposed to the views of Gowers and others who believe that the taste fibers of the chorda tympani distribution run to the gasserian ganglion and pons by way of the fifth nerve, my observations being entirely in accord with those of Cushing respecting this much disputed matter. It is true that in some instances in my cases taste was lost after trigeminal section in an early period, one usually of only a few days and always less than two weeks, but was gradually or somewhat rapidly restored. In some of these cases the gustatory response when present was more delayed upon the paralyzed than upon the unaffected side. Doubtless the explanations offered by Cushing for this partial and early loss of taste are the best, namely that interference with the vascular supply and the nutrition of the tongue which results from the fifth nerve section has a considerable effect for a short time upon the taste buds, although the exact mechanism of this interference is not easy of explanation. This abeyance of the sense of taste may explain the cases which have been reported by such highly competent observers as Gowers and Horsley.

LOSS OF TASTE IN PERIPHERAL FACIAL PARALYSIS

The cases of peripheral facial paralysis now reaching into scores or even hundreds studied by me during a long neurological practice, when severe if carefully studied have almost invariably shown impairment or loss of the sense of taste in the well-known chorda tympani distribution on the anterior portion of the tongue. My observations as to the preservation or impairment of taste in the palatal region are much less numerous, but are sufficient to indicate that loss of taste does not commonly occur in Bell's palsy. That taste buds are present in the soft palate need not be demonstrated. The evidence is abundant with regard to this matter. In the two cases of Hunt's first paper on "Herpetic Inflammation of the Geniculate Ganglion, a New Syndrome and Its Complications," he says that taste was not lost. Two explanations may be offered of this finding. The first case was one of very mild type, recovering in three or four weeks, and in

such cases occasionally the impairment of taste is slight, transient, or not present. The second case, in which he obtained a necropsy, was of serious type, and the only explanation which I can offer is that it is possible the gustatory response which he obtained was from the extreme anterior part or tip of the tongue on the affected side. This small area, as I have shown elsewhere, is supplied not by the chorda tympani but by a branch of the glossopharyngeal. In all the cases of facial paralysis, especially studied in the preparation of this paper, taste was lost in the chorda tympani area, in one case on both sides of the tongue, a matter difficult to explain unless it was dependent on some local condition.

VASODILATOR AND SECRETORY FIBERS WHICH PASS BY WAY OF THE GENICULATE GANGLION

Brief reference should be made in passing to the fact that experiments which are regarded as almost classical in physiology have demonstrated that through the chorda tympani pass vasodilator and secretory nerves, the former to the tongue and probably to the sublingual and submaxillary glands, and the latter to these glands. These vasodilator fibers, however, while passing by way of the geniculate ganglion, have no direct connection with it, and the secretory fibers for the sublingual and submaxillary glands have ganglia of their own in or near these glands.

SUPPOSED PATHWAY OF SENSORY IMPRESSIONS FROM THE EXTERNAL EAR TO THE GENICULATE GANGLION

Leaving now the questions of the gustatory, vasodilator and secretory functions of the nerves of the geniculate system, let us next turn to the cutaneous sensory supply of the external ear. Taking up the question first, of the route by which the auricular sensory area is supposed to be connected with the geniculate ganglion one pathway that has been suggested has been through the auriculotemporal distribution of the fifth to the otic ganglion, and thence by the small superficial petrosal to the geniculate ganglion. Of the small superficial petrosal nerve it may be said that both its anatomical and its physiological relations are not as yet clearly defined. Following the usual anatomical descriptions, this nerve originating in the geniculate ganglion soon leaves

the fallopian aqueduct through a canal near the hiatus fallopii, and goes forward lying in an osseous groove under the dura, usually escaping from the skull by a small foramen to enter the otic ganglion. This ganglion has traversing it branches from the fifth, probably motor, to the tensor palati and tensor tympanum, and also according to received anatomy, it gives branches to the auriculotemporal nerve and to the chorda tympani.

If the geniculate ganglion is supposed to be the origin of the cutaneous and membranous supply of the tympanic membrane and the skin of the external canal and auricle through the small superficial petrosal and otic ganglion, it could only be in this roundabout way.

Another course, however, may be taken by the small superficial petrosal nerve after it leaves the geniculate ganglion. It is usually said to give off a branch to the tympanic nerve, but some regard this as the main division of the nerve; still others regard this as a branch of the tympanic nerve of the glossopharyngeal to the lesser superficial petrosal nerve. If sensory impressions are conveyed from the membrane of the tympanum, external auditory canal, and auricle by way of the small superficial petrosal nerve, it would seem that it must be through this communicating branch between the tympanic branch of the glossopharyngeal, or by way of the communicating branches of the otic ganglion to the auriculo-temporal or the chorda tympani. Such sensory impressions may of course take their way as thus indicated, but this is a mere matter of conjecture, and has not been proved by anything that has been reported.

THE FIFTH NERVE SUPPLY TO THE EAR AS DETERMINED BY SECTIONS OF THE TRIGEMINUS

In those cases of fifth nerve section or gasserian extirpation studied by me in which either the third branch of the fifth or both the second and the third branches of the fifth were directly or indirectly severed, the fifth nerve supply indicated was to the tragus and anterior part of the canal, much the same as that determined by Cushing. After trigeminal section this region of the ear is not insensitive to all forms of sensation. It may respond to painful stimuli, but not to examination with the hair esthesiometer or with a small camel's hair brush. These findings

are in accord with those of Cushing who found a narrow strip of lost tactual sensibility bordering his large general area of complete anesthesia after trigeminal section.

It is probable that in the compacted space which forms the external auditory meatus the overlap of the different neural supplies to the ear—the trigeminal, great auricular (cervical), vagal and possibly the glossopharyngeal—is such that section of any one of the nerves going to the auricle will not cause complete

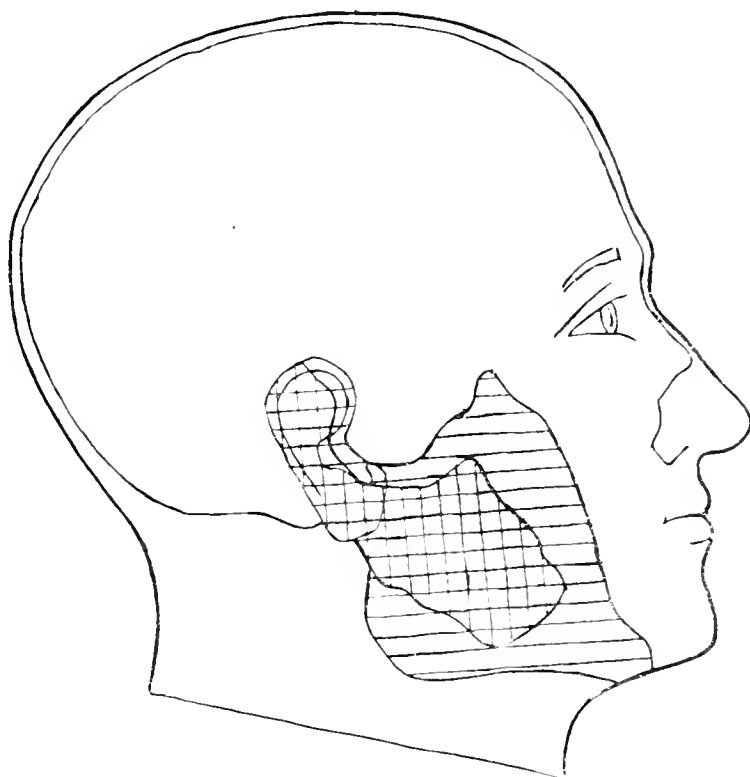


FIG. 2. Tactile changes following section of the great auricular nerve. Examination twenty-four hours after section. Vertical shading denotes anesthesia to camel's hair brush; horizontal shading denotes area abnormal to stroking touch. (Trotter and Davies.)

anesthesia. As determined by Head in his investigations on the median and other nerves if one nerve is cut, as the median, the area of complete protopathic loss is smaller than that for the other forms of sensibility, protopathic sensibility being preserved in the area of section through overlap of the adjoining nerve supply, in the case of the median for instance, by ulnar overlap.

Great care should be taken in drawing conclusions in cases of supposed gasserian extirpation or of section of the sensory root of the trigeminus. Not infrequently this extirpation is

incomplete and it sometimes happens that the sensory root is not cut or only partially sectioned when it is believed that a complete section has been made.

DISTRIBUTION OF THE GREAT AURICULAR NERVE TO THE EXTERNAL EAR AS DETERMINED BY SECTION OF THIS NERVE

The distribution of the great auricular nerve to the ear and adjoining parts as demonstrated by section of this nerve in man, is indicated in a diagram in one of the contributions of Trotter and Davies. These investigators found that twenty-four hours after section of this nerve, which was performed on one of them for the purpose of studying the conditions of sensation after section and during the repair of nerves, impairment of tactual sensation was present in the areas indicated in the diagram. The more marked anesthesia was in the more central portion of the area, including the ear, and was determined by the camel's hair brush. This is indicated by the vertical shading. A wider limit of slighter hypesthesia was determined by the finger stroking method and is indicated by the horizontal shading.²

DISTRIBUTION OF THE VAGUS TO THE EXTERNAL EAR

The auricular branch of the vagus as described in Morris' anatomy by Dr. H. St. John Brooks, has the following course and distribution: "It arises from the jugular fossa, and traverses the bone, passing to the inner side of the aqueduct of Fallopius, and merges behind the pinna, where it divides into two branches, one of which joins the posterior auricular branch of the facial, while the other supplies the posterior and inferior part of the external auditory meatus and the back of the pinna."

This auricular branch of the vagus is to be regarded as afferent (cutaneous, sensory), and as having its nuclei of origin in the jugular ganglion. It is very rare to get a case of any form of disease which will throw light upon the distribution and the function of this branch of the vagus.

²In the finger stroking method, which was first suggested by Trotter and Davies, the patient examines himself for impaired sensibility by gently moving the finger tip or tips from the regions of retained sensibility toward that in which it is presumably impaired. As soon as this limit is reached he will usually at once indicate the fact. The method has proved in my hand a very useful one, the patient frequently marking out with great exactness a region of very slightly diminished sensibility.

Some well-known facts with regard to the reflexes from the external auditory canal are not without value. In many persons a cough is at once produced by slight irritation of the external auditory canal. This often occurs during an examination of the ear. I have made some personal observations with regard to this reflex which are in accord with those which have been reported to me by some of my friends among the otologists and laryngologists. Dr. George C. Stout and Dr. B. A. Randall, of Philadelphia, for instance, are both inclined to place the seat of the most ready production of this aurolaryngeal reflex in the posterior inferior portion of the auditory canal. In some, slight irritation of this region by a probe or light object of any sort may cause a sharp cough difficult to control. This region of easy stimulation is probably within the area of the vagus.

Besides the supply to the posterior wall of the canal the auricular branch of the vagus probably also is distributed to a portion of the concha, and to the postero-mesial surface of the auricle; possibly also to the posterior segment of the tympanic membrane, although this is supposed by some to be in the distribution of the glossopharyngeal.

Hunt in his extensive research of the literature of herpetic inflammation of the cephalic extremity was able to find only one case, that of Buys, which he supposed might be referable to involvement of the ganglion of the vagus. "A girl aged seventeen years. Onset with headache and vomiting. Severe headaches continued with stiffness of the neck and frequent vomiting. Photophobia, no fever and no delirium. The pulse was slow and irregular. . On the fourth day the acuteness of the pain subsided and settled in the mastoid region of the right side. The mastoid was tender, as was the canal on the introduction of the otoscope. Hearing was diminished. On the fifth day herpetic vesicles made their appearance on the antitragus and lobule of the ear. The headache and neck pains were less severe. On the sixth day a fresh crop of vesicles made their appearance on the mesial surface of the pinna and the lobule. All pain disappeared in the course of a few days, and the hearing was restored. In fifteen days the eruption had vanished." Some of the symptoms in the case were distinctly vagal.

According to the description of the auricular branch of the vagus as generally accepted, the herpes of the membrane described

by Orbison might be referred to this nerve as readily as to the glossopharyngeal. Indeed this area may be in whole or in part supplied either by the vagus or the glossopharyngeal, or by both, these two nerves arising in adjoining ganglia.

THE TEACHING OF CASES OF AURICULAR HERPES

Such cases of herpes of the cephalic extremity as I have seen, as well as the literature of the subject, point to the herpetic inflammation having occurred either in the gasserian ganglion, the ganglia of the second and third cervical nerves, and possibly the petrous or the jugular ganglia. In the vast majority of cases the evidence is in favor of the cervical and the gasserian ganglia. An otitic herpes of geniculate origin seems to be largely presumptive. The herpetic ulcers in all the cases described have been either on the auricle itself or in the external auditory canal—in a very few instances like that reported by Orbison, on the membrane of the drum.

The following case of herpes is of interest as bearing upon the question under consideration, that of the nerve supply to the external ear.

A man about seventy-three years old was seen in consultation with Dr. J. Gurney Taylor. The patient was in good general health, active for his age, but for several years at times had suffered with attacks of pain with some swelling about the right ear, seemingly just outside and at or near the entrance to the external auditory canal. Shortly before he was seen by me he had a sudden and very severe attack of herpes. His face along the lines of eruption was extremely painful and much swollen. After the violence of the first attack, in a day or two, the generalized inflammation began to subside. It was then found that he had a widely distributed region of herpetic ulcers.

At the time of my examination these ulcerations and the inflammation attending them had largely subsided. The herpes covered a large area of the posterior part of the head, neck, the lower face, and the ear and region in front of it. The eruption was especially marked and widely distributed on the ear. One ulcer was present at the entrance of the external auditory canal at its posterior inferior part. The patient complained of a feeling of impaired sensation, and examining him with a finger and

with a hair over the head, ear, and face, he did not feel the touches and manipulations quite as well on the eruptive as on the other side. He was nowhere totally anesthetic, and in various places he still had pain.

It was evident that the nerve distributions indicated by this eruption were confined to the upper cervical nerves, particularly the second and third. The trigeminus and vagus were not implicated. It was not necessary to evoke either the petrous or the geniculate ganglion to explain the eruption.

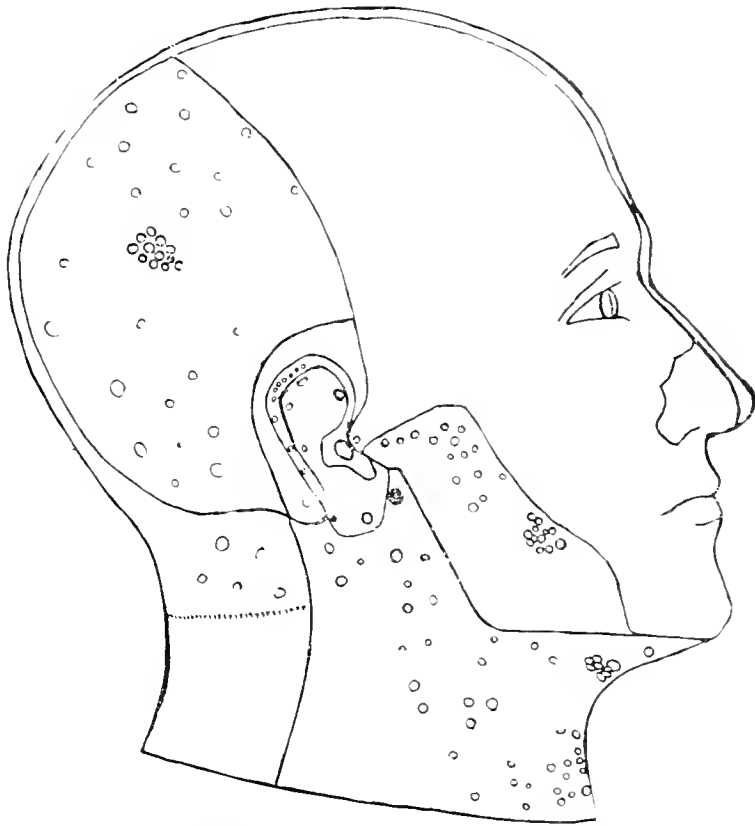


FIG. 3. A case of herpes occipito-collaris indicating by the eruption the superficial sensory distribution of the upper three or four cervical nerves. The areas included are those of the great and the small occipital, the great auricular and the superficial cervical nerves. The trigeminal sensory distribution is outlined exactly by its exclusion from the eruption.

DISTRIBUTION OF THE GLOSSOPHARYNGEAL NERVE TO THE TYMPANIC CAVITY, MEMBRANE AND EXTERNAL AUDITORY CANAL

The branches of the glossopharyngeal which are sometimes given as going to the membrane of the tympanum and external auditory canal, as well as to the palatine and alveolar regions, arise in the petrous ganglion (ganglion of Andersch). The

branch which passes from this ganglion to the tympanic cavity is known as the tympanic nerve or the nerve of Jacobson. It has a half dozen branches, which with their communications form the tympanic plexus. A portion of the tympanic membrane, probably its posterior segment, may be supplied by one of these branches of Jacobson's nerve. Other branches, as has already been shown, communicate with the great and the lesser superficial petrosal nerves, and in the case of the small superficial petrosal, go to the otic ganglion, and by way of the great superficial petrosal and vidian branches may proceed to Meckel's ganglion and thence to the palatal region. It is known that the branches of the tympanic plexus supply the mucous membrane, or a part of it, lining the membrane of the tympanum, and also of the eustachian tube.

Orbison has reported a case which is of value and interest in connection with the part of our problem under discussion. The case was well observed, the herpetic bleb on the membrane of the tympanum not only having been studied by Orbison, but by a laryngological colleague, Dr. Roberts. Briefly summarized, this patient, who had a gouty and rheumatic history, and what might be termed both a personal and a family history of herpes, as one of her brothers had had this disease, and the patient herself had suffered from it on several occasions in various parts of the body, was attacked with a painful throat and nasopharyngeal affection, probably rheumatic or gouty in origin. This was accompanied by constitutional symptoms and infection. On the third day she had earache and fulness in the left ear. Deafness soon followed. Aural examination showed a bleb on the left membrane of the tympanum, beginning in its posterior part and soon covering the whole membrane, and looking like a crystal. It is interesting to note that the use of the speculum caused but little pain, showing probably some anesthesia. In three days the bleb began to disappear and with it the deafness. Later eruptions were present in the mouth, and on the palatine and alveolar regions, and the patient had a polyneuralgia during her entire illness.

It might of course be claimed that the evident herpetic inflammation of the membrane in this case was due to the involvement of some other zoster zone than that of the petrosal ganglion. With regard to the geniculate ganglion however, it must be

remembered that symptoms usually accompanying affections in this ganglion were not present unless we regard the tinnitus and deafness as such, but these are much more readily explained by the implication of the tympanic cavity and membrane. Facial paresis or paralysis was not present. It might be said in this connection that the symptom complex of herpes with acoustic phenomena might in most cases be quite as readily explained without as with involvement of the geniculate ganglion, and the adjoining auditory nerve. Deafness, tinnitus, pain in the ear, hyper-acousia, or hypo-acousia, one or all, may be produced by affections of the middle or even of the external ear. Is it reasonable, therefore, to tabulate such cases as if they were in all or a large percentage of cases due to herpetic inflammation of the geniculate ganglion? Often the symptom complex includes facial paralysis and auditory phenomena of various description and may of course be due to nerve affections at points removed from the geniculate ganglion. Herpes is just as likely to be the result of petrous, jugular or cervical ganglionic disease, as of disease of the geniculate ganglion.

One of two cases reported by Hunt, a case in which a necropsy was obtained, was a man forty-eight years old, who when admitted to the hospital was suffering from facial paralysis and herpes occipito-cervicalis (occipito-colaris). The symptoms were those of a case of typical peripheral facial paralysis with herpes in the distribution of the second and third cervical nerves. On necropsy the facial nerve, the intermediary nerve of Wrisberg, brain, spinal cord, etc., were removed. The geniculate ganglion was lost in the necropsy. The microscopical examination showed degeneration in the peripheral portion of the seventh nerve, in the intermediary nerve of Wrisberg, and some change in the nuclei of the facial. Similar degeneration was found in the cervical nerves, and certain changes in the cord. The chorda tympani was apparently not examined. If the geniculate ganglion was involved, the result was simply to give a syndrome such, with the exception of the loss of taste, as is usually obtained in any case of seventh nerve paralysis, the herpes being referable to the inflammation of the cervical ganglia.

THE QUESTION OF THE IMPAIRMENT OF SENSATION IN PERIPHERAL FACIAL PARALYSIS

The entire number of cases of facial paralysis included in this study were examined for light touch, and for pain in all parts of the external ear including the canal. In three instances, as already described, the patient was hypesthetic on the ear of the paralysed side, but this hypesthesia covered distinctly the areas of the cervical, fifth and vagus nerves. Indeed it included all parts of the ear and its posterior and anterior borders. In two of the cases the patients were hypesthetic over the entire side of the face and head and also on the paralyzed side of the tongue. Unquestionably these cases were instances of so-called hysterical or suggested hypesthesia. In only one case was there an extremely slight hypesthesia in a narrow strip at the entrance of the ear.

In the light of these cases I do not see how it is possible to conclude that there is a cutaneous auricular area which is supplied by the sensory branch of the seventh nerve.

THE GENICULATE GANGLION AND PAIN IN THE EAR

In the paper on otalgia considered as an affection of the sensory system of the seventh cranial nerve, Hunt collects an important array of well-known facts relating to otalgia, in support of his geniculate facial sensory theory. Accepting his view of the sensory functions of the geniculate, pain circumscribed to the ear is regarded as in the sensory division of the seventh. His claim is that in certain sharply circumscribed otalgias, the pain under the theory adopted can only be explained by the direct or indirect implication of the geniculate ganglion or its central or peripheral processes.

Little need be said about the hypothesis of the geniculate origin of primary otalgia. It amounts to little more than an assertion that this is due to geniculate disease.

The forms of otalgia of most practical interest because of their frequent occurrence and the numerous observations which have been made of them, are those which are classed under the head of referred and reflex otalgias. Here the otologist, laryngologist, dental surgeon, neurologist and internist all might have something to say from their experience. Briefly stated, Hunt's

argument is that otalgia is a somewhat frequent referred symptom, and this no one will deny, occurring especially as the result of various diseases of the mouth, throat, teeth and jaws. In all such affections however the pain is referred from a region which is universally regarded as supplied by branches of the fifth, or in a few instances perhaps by the ninth or the tenth. According to this view when one has a pain in the ear from an abscess at the root of a tooth, from a sinus involving the periosteum and bone, from a catarrhal inflammation of the nasopharynx, in the disease focus originate impulses which are conveyed through branches of the fifth or other nerves by well-known routes chiefly petrosal, to the geniculate ganglion, and thus pain is produced in the auricle and external auditory canal, including the membrane of the tympanum.

This argument is at least not convincing. As the trigeminus, glossopharyngeal, and vagus all have a sensory supply to the ear, why is it necessary to evoke the geniculate ganglion, and the seventh nerve, in order to explain the pain? Is it not more reasonable to suppose that the pain impulses travel by routes forming a part of the neural distribution of the nerve in which they originate?

One case of operation for what was supposed to be idiopathic otalgia has been recorded by Clark and Taylor, of New York. In this case section of the posterior root of the geniculate ganglion (intermediary nerve of Wrisberg) was performed for the relief of pain. The case was reported very early after operation. It is held by the recorders that the relief of the pain in this case was due to division of the seventh-nerve's sensory root. The effects of decompression in such cases should not be overlooked.

Several years since Dr. Chas. H. Frazier, in one of my cases, after making the subtentorial intracranial opening, severed both the seventh and the eighth nerves as indicated by the complete facial paralysis and deafness. This patient had suffered intensely with pain in the head, not especially confined to the ear, although more marked on the side of operation. During the few days preceding the surgical procedure the pain was so constant and so intense as to call for the administration every two or three hours of narcotics and sedatives. The pain disappeared after the operation and has never returned, although the patient still has some symptoms of intracranial and cranio-neural disease. I

was inclined in this case to attribute the result more to the effects of decompression than to section of the seventh and eighth nerve, and refer to the case as one of interest in connection with the general discussion of the sensory function of the accessory seventh.

A CASE OF PERIPHERAL FACIAL PARALYSIS WITH NECROPSY AND MICROSCOPICAL EXAMINATION

In one case of seventh nerve paralysis studied at the Philadelphia General Hospital, I had the opportunity of obtaining what is in my own experience extremely rare, a necropsy and microscopical examination. These were both conducted by Dr. Edward Mercur Williams, clinical and pathological assistant in the neurological department of the University of Pennsylvania. Dr. Williams also had the opportunity of studying this case with me.

This patient was a man eighty years old, who was admitted to the Philadelphia General Hospital, November 5, 1909, suffering from general debility, with advanced arteriosclerosis. Necropsy showed advanced disease of various organs, including cardiac degeneration, fibroid tuberculosis of the left lung, hemorrhagic cystitis, acute fibrinous peritonitis and carcinoma of the stomach. This man had a right-sided facial paralysis which was ten days old at the time of his death.

Examination immediately after his admission showed a complete seventh nerve paralysis. The patient was unable to wrinkle his forehead on this side, to close the eyelid, draw up the corner of his mouth, and his speech was difficult to understand, apparently because of the interference with articulation as a result of the palsy. He stated that three days previously, on awaking in the morning, he had for the first time noticed this paralysis.

Owing to the man's low intelligence or mental state it was difficult to obtain facts from him. No sensory changes were found on examination of the external ear and canal, and no area of hypesthesia on the anterior part of the right side of the tongue, although the mental and physical condition of the patient made it difficult to determine any facts regarding sensation and impossible as regards taste.

At the autopsy the facial nerve external to the stylo-mastoid foramen, with its several branches, to a distance of about an inch,

was carefully dissected out. The skull was then chiseled and broken in such a way as to remove largely the petrous portion of the temporal bone with the internal and external auditory canals and the stylo-mastoid foramen, the peripheral portions of the nerve being kept intact. Because of the manner in which the bone was cut through, the tympanic cavity was exposed and a portion of the chorda tympani was removed for examination. By carefully nipping the bone from the internal auditory meatus, the course of the facial nerve was followed, and a portion of this nerve obtained, also the geniculate ganglion, a small part of the great superficial petrosal and of the proximal portion of the facial with the pars intermedia, although it was impossible to separate the facial from the intermediary nerve.

The geniculate ganglion stained by methods of Marchi and hemalum-acid fuchin, showed the cells to be, with few exceptions, normal in size and contour, having nuclei distinct, well stained and centrally placed. The layers of cells forming the capsules of the ganglion cells were also normal, showing neither faulty staining, disintegration nor proliferation. The amount of pigment in the cells was rather large, but not excessive and could not be considered abnormal in a patient of such advanced age.

A few of the cells, as mentioned above, showed a shrinking, with vacuoles around the periphery. These however were only postmortem changes, and the staining properties of the cells were otherwise normal, and the cell capsules were nowhere broken down. No cellular infiltration nor any other change indicated any acute or chronic process as occurring in the ganglion.

The facial nerve showed degeneration throughout its course from the part external to the stylo-mastoid foramen to and including the part entering the internal auditory meatus. This degeneration was, however, more marked and more extensive in the peripheral part. It was also very distinct in the part close to and at the level of the geniculate ganglion.

The part just at the entrance of the internal auditory meatus was degenerated, but not to the extent of that peripheral to this ganglion, that is, not as many fibers comparatively speaking, were degenerated as in the peripheral trunk.

The chorda tympani and the great superficial petrosal nerves were both normal; the latter were sectioned at its entrance to

the geniculate ganglion, but showed no degeneration nor change of any character.

The intermediary nerve of Wrisberg could not be separated from the facial sufficiently accurately for study.

As bearing upon the main subject of this paper, the sensory functions attributed to the seventh nerve, this necropsy, although interesting, does not perhaps shed much light. It has, however, two or three points of value, even in this discussion. In the first place it showed probably the usual method in which the seventh nerve is attacked, and in which it degenerates in the average case of Bell's palsy. What probably takes place is that the nerve exterior to the foramen is attacked by the inflammatory process, this extending through the foramen into the fallopian canal. The geniculate ganglion is in all probability very rarely primarily attacked in the ordinary case of seventh nerve paralysis. It may, however, in particular instances be the seat of a posterior poliomyelitis as believed by Hunt. In such cases it is altogether probable that other ganglia concerned with cutaneous nerve functions would be the seat of similar inflammation and would be the pathological cause of any herpes that might be present. The chorda tympani in the case studied by Williams seems to have been not degenerated. This may be the case even in some of the instances of severe facial paralysis in which impairment or loss of taste is present on the anterior two thirds of the tongue. The chorda tympani in these cases becomes involved through pressure from the inflamed facial or perhaps by direct extension of inflammation to it. In some cases, however, the chorda tympani may largely escape serious interference with its functions, thus accounting for those cases in which taste is not at all or but little impaired.

CONCLUSION

1. If by the seventh nerve is meant that nerve trunk which arises in the pons from the lower and upper facial nuclei, this nerve is purely motor.
2. It is doubtful whether nerves whose functions are concerned with the pressure and postural senses are conveyed in the branches and trunk of the motor facial.
3. The afferent systems for epicritic and protopathic sensibility are not represented in the seventh nerve.

4. The geniculate ganglion is the homologue of the dorsal spinal ganglia.

5. If the geniculate ganglion, the intermediary nerve of Wrisberg, and the chorda tympani are considered part of the facial or seventh nerve, then this nerve may be regarded as partly sensory, having functions chiefly gustatory.

6. Nerve fibers concerned with the transmission of gustatory impulses proceed from their origin in the geniculate ganglion to their distribution by way of the great superficial petrosal nerve and the chorda tympani. The destination of the former nerve is the soft palate, where its fibers terminate in taste buds, and of the latter nerve the taste buds in the anterior two thirds of the tongue with the exception of its tip.

7. Evidence is lacking that in the facial trunk proper, in the intermediary nerve of Wrisberg, the great superficial petrosal, the small superficial petrosal, or the chorda tympani, are nerves of common sensibility, although some observations would seem to indicate that the anterior part of the tongue and possibly a very small strip of the auricle have a vestigial supply of this sort.

8. Herpes does not originate from inflammation of nerves which are not concerned with cutaneous or membranous sensibility.

9. Limited inflammation of the geniculate ganglion may in rare cases occur, producing a syndrome whose factors are loss or perversion of taste and vasodilator and secretory phenomena.

10. If the geniculate ganglion is the seat of inflammation, adjoining parts such as the facial nerve proper, and the eighth nerve may be involved by pressure or extension, thus giving rise to peripheral facial paralysis and to acoustic phenomena and phenomena of equilibration and of orientation, vasodilator and secretory symptoms or to some of these symptoms.

11. The cases of herpetic inflammation—cervico-occipital, auricular and facial—which have been observed in connection with facial paralysis, or facial paralysis and acoustic symptoms, are best explained on the supposition of an involvement of ganglia other than the geniculate.

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Society Proceedings

CHICAGO NEUROLOGICAL SOCIETY

January 27, 1910

The President, DR. L. HARRISON METTLER, in the Chair

PRESENTATION OF PATIENT SHOWING LID CLOSURE PUPILLARY REFLEX

By William H. Wilder, M.D., and C. G. Darling, M.D.

Dr. Darling stated that the man had contracted syphilis seven years ago, and that vision began to fail three years ago. The pupils are widely dilated and do not react to light. Accommodation is paralyzed. There is a trifling reaction in convergence. With correction the man is able to see normally and to read with a plus 2 added. The fundus is normal. Whenever the man tries to close the lids forcibly the pupils react. Any drug that irritates the conjunctiva also causes reaction of the pupils.

Dr. Wilder thought the case analogous to cases of ptosis, occasionally seen, where the patient is unable to open the eye except when he opens the mouth. In such cases it would seem that there must be some connection between the nerves supplying the muscles of the jaw and the upper eyelid. In the present case one would suppose there must be a connection between the seventh and third nerves at some point.

Dr. Henry Gradle said the associated movement described by von Graefe early in his career has been forgotten and redescribed a number of times since. There is practically nothing except the association which is seen in nearly every normal person.

Dr. Charles L. Mix said the posterior longitudinal bundle which connects with the eleventh, twelfth, seventh, sixth and third nuclei, may explain these associated movements. It may be that when the seventh nerve is innervated forcibly that some impulse is carried by the fasciculus longitudinalis posterior to the nucleus and so reaction is bound to take place.

Dr. Darling said that Dr. H. Gifford, of Omaha, called attention to this in 1895. He found that some anatomists stated that the seventh nerve had a common origin with the third.

As there is an association between seventh and third nerves in almost every normal person, this reflex is present in most cases, but has been shown best in cases of optic atrophy when the pupil is widely dilated. Dr. Darling thought the present case a very unusual one on account of the paralysis of accommodation and dilated pupil which is not due to loss of sight and because the pupil does not react to light, but does to closure of the lids.

TWO CASES OF HYPOPHYSECTOMY

By A. E. Halstead, M.D.

Case 1. Dr. Halstead presented the patient, a man 39 years old. He dates his illness back two years, beginning with frontal headache of a pricking character. His eyesight began to fail a year ago. The presence of aortic regurgitation and perforated nasal septum suggested syphilis and therefore a course of mercury and potassium iodide was given by various doctors for a number of months, while his condition became progressively worse. There were no signs of acromegaly nor of the *typus Froehlich*, and therefore the diagnosis was not made until bitemporal hemianopia was added to the initial general narrowing of the visual fields, and bilateral optic atrophy appeared. Some polyuria.

Patient denies syphilis. He had rheumatism eighteen years ago followed by aortic regurgitation of a mild character. He was injured nine years ago by a blow between the eyes which made him unconscious for fifteen minutes. Otherwise he has always been in splendid health. No change in the sexual characteristics. He is married but has no children. A sister has chorea. No case of tumor in the family. The father died of rheumatism.

Vision before the operation taken at the Illinois Eye and Ear Infirmary: *Right eye*—4/200; *left eye*—5/200. The operation was performed six months ago.

Technique: Usual preparation. The anesthetic was started with ether. A high tracheotomy was done and a Trendelenburg canula inserted. Chloroform was now used for the anesthetic. The upper lip was raised and an incision made in its mucous membrane, about five-sixths of an inch from the cutaneo-mucous junction, and parallel to the lip. The soft tissues were freed and the nose gradually drawn up with retractors, the septum being loosened with bone forceps. The turbinates, the vomer and the perpendicular plate of the ethmoid were removed. An opening was then made through the sphenoidal sinus and a blue-colored pulsating mass seen. Tapping of this caused no hemorrhage. It was then curetted out. The whole cavity, now the shape of a cylinder, one inch in diameter and five inches long, was packed with iodoform gauze, coming out of the nares. The septum was sutured back, and the mucous membrane of the mouth replaced and sutured. The tracheotomy tube was not taken out.

Subsequent History.—For several days after the operation the patient had a high temperature (up to 105 degrees) which went down rather rapidly after the packing was removed. Otherwise his recovery was uneventful. His headache has entirely disappeared since the operation. Very striking is the great improvement in his vision, in the *right eye* from 4/200 before the operation to 6/15 after the operation, and in the *left eye* from 5/200 before the operation to 6/22 after the operation.

Pathological Report by Dr. Dean D. Lewis.—The specimen consisted of several fragments of tissue which were fixed in Zenker's fluid—embedded in paraffin and, after sectioning, stained with a number of different stains, such as hematoxylin and eosin, Van Gieson's picrofuchsin, neutral gentian and iron-hematoxylin. The two latter stains were employed with the idea of determining whether specific granules could be found in the cells or whether intercellular bridges were present.

Histologically, this tissue consists of a number of papillary growths

supported by a delicate connective tissue stroma. In some sections distinct groups of polygonal cells are found. This polygonal form is evidently due to the transverse cutting of cells to be described later. The cells resting upon the connective tissue stalk are columnar. They have at their base a clear cytoplasm, but the peripheral part of the cells usually is composed of a cytoplasm, which stains more heavily with eosin. In none of the cells is there any evidence of keratohyalin. As yet no intercellular bridges have been demonstrated. In some cases granules have been stained within the cells, but in most instances these granules seem to represent nodal points in the spongiasma of the cell. In some places the columnar cells seem to be arranged around a lumen, which is very small, which seems to contain in some instances a little mucoid material.

The histological significance of a tumor of this character occurring within the sella turcica is a little difficult of interpretation. It corresponds in many ways with the tumor described by Saxer, originating from the infundibulum, which he believed to have originated from the cells of the pars intermedia of the hypophysis.

This tumor has later been regarded by Erdheim as originating from embryonal pharyngeal epithelium, which in some instances lies encapsulated in the anterior part of the anterior lobe of the hypophysis. He has found this undifferentiated pharyngeal epithelium in ten out of thirteen adult hypophyses examined by him.

Dr. Halstead believed this to be an epithelial tumor developing in the sella turcica from fragments of undifferentiated epithelium developing from the cranio-pharyngeal duct.

Case II. The second patient was an unmarried woman aged 32. Her illness began two years ago with eye symptoms which progressed under various diagnoses until the appearance of bitemporal hemianopsia, optic atrophy, severe headache and vomiting with some rather slight acromegalic changes made an unmistakable picture. Her menses have been irregular for over twelve years but not diminished in amount. No polyuria, adiposity or changes in the external sex characteristics. Constipation marked. Her mother died of a uterine tumor.

Technique.—Usual preparation. The anesthetic was started with ether. A high tracheotomy was done and a Trendelenburg canula inserted. Chloroform was now used for the anesthetic. A gauze tampon was packed into the pharynx and aditus laryngis. The upper lip was raised and an incision made in its mucous membrane, about five-sixths of an inch from the cutaneo-mucous junction, and parallel to the lip. The upper lip was then separated from the superior maxilla by blunt dissection and use of the elevator, the upper lip being gradually retracted.

The alæ and cartilaginous septum were reflected upward and held by retractor. The nasal cavity was opened and the turbinate, vomer, and the perpendicular plate of the ethmoid were removed. The ethmoid cells were then cleaned out by curette and punch. The anterior wall of the sphenoid sinus was removed by the Hajek punch and pliers. The hemorrhage was stopped by packing with adrenalin gauze for five minutes. The posterior wall of the sphenoid sinus was then removed by the Hajek punch and pliers. Hemorrhage was again stopped by an adrenalin tampon.

The fatty tissue of the hypophysis capsule was next removed and then a cyst-like structure with gelatinous contents not unlike soft granulation tissue.

The whole cavity, now the shape of a cylinder, one inch in diameter and five inches long was packed with iodoform gauze, four strips, two coming from the nares and two from the mucous membrane incision. The septum was not sutured back nor was the mucous membrane sutured. The tracheotomy tube was not taken out, nor was the packing in the pharynx removed until the patient was back in bed. Then the packing was removed when she had regained consciousness and the tracheotomy tube somewhat later. Patient's pulse was then 140, respiration 120.

Just before the conclusion of the operation, the patient suddenly stopped breathing, though her pulse remained unchanged. The tracheal canula was removed and found to contain a clot of blood. Patient was very slow in reacting to stimulation (camphor and ammonia) and to artificial respiration. It was nearly three quarters of an hour before she was breathing naturally again. The pulse, however, remained strong at all times and increased only about ten beats in rapidity (120 to 130). The patient had been taking urotropin, 30 grains daily, up to the time of operation, at which time it was stopped. Ten hours after the operation, 9 P. M., her temperature went up to 105°, pulse 136, respiration 28. She had a fever of over 102° ever since temperature was first taken three hours after the operation. Examination showed no rigidity of the neck, slight headache, no Babinski, no tache cérébrale or increase in the reflexes. No cutaneous hyperesthesia. Lungs negative. The packing was removed. It was odorless. No pus present. Normal salt irrigation.

Next morning at seven o'clock, temperature was 104°, pulse 160, respiration 32. Lung examination negative. No physical signs of meningitis. A lumbar puncture was not made. The patient died at two o'clock in the afternoon of the same day. Shortly before death, her temperature was 107.4°, pulse 160, respiration 48. A post mortem was not allowed. The cause of death seems doubtful and seems to lie between a central circulatory disturbance, and an absorption of crushed hypophysis material (as suggested by Dr. Hamburger). That it was a meningitis fulminans seems less probable.

Pathological Report by Drs. LeCount and Dean Lewis.—The pieces removed were fixed and stained in the same way as in the preceding case. Several chips of bone were found in the material sectioned and two pieces which are parts of the hypophysis.

The hypophyseal cells are arranged in columns, much as in the normal glands in areas; however, these cells are much more closely grouped and the cell columns are larger than is usually the case. One of the most striking things about this hypophyseal tissue is the amount of stroma, which in some fields is much greater than is usually the case.

From the histological picture it seems that we are dealing with active hyperplasia of the chromophile elements of the gland, which in some fields gives distinct evidence of adenoma formation.

REPORT OF A CASE IN WHICH A PITUITARY TUMOR WAS REMOVED FROM A PATIENT WHO MADE A PRIMARY RECOVERY

By Allen B. Kanavel, M.D.

The successful removal of tumors of the pituitary gland is not so frequent but that the following brief note should be of interest. The

patient whose history will be given by Dr. Grinker was referred to Dr. Kanavel in June, 1909, at which time, after studying the various routes suggested by various operators, and following out the technique upon the cadaver, it seemed that an entirely new entrance could be made with greater safety to the patient and much more readily than by any other of the routes proposed.

Dr. Kanavel therefore worked out upon the cadaver a route which it has seemed wise to call the infra-nasal route, since the essential feature of the procedure was that the tumor was reached by going through the inferior portion of the nose rather than the superior as is common in the Von Eiselsberg, Schloffer and other methods. The technique consists essentially in deflecting the cartilaginous septum, removing a section of the vomer and the anterior wall of the sphenoid, which brings us directly down upon the sella turcica. Entrance can be made through this easily and the tumor removed with the curette.

Dr. Kanavel has described this technique in the *Journal of the American Medical Association*. The report herewith presented, details the history of a patient upon whom he operated and removed the tumor by the route suggested. He found the procedure exceedingly simple. The operation can be performed quickly and with little difficulty. There are only three questions to be considered in the procedure: (1) The hemorrhage which may be met with, (2) possibility of infection, (3) the question as to the absorption of pituitary toxins after curetting out the tumor.

The first of these can be controlled by packing; the second is certainly much less likely to occur when the operation is performed in the manner Dr. Kanavel suggested than by either of the other routes; while concerning the third we are still in the dark and it will remain for the future to determine the results which may be obtained from such a procedure.

Dr. Kanavel's patient lived for five weeks after the operation, which consisted in the removal of a tumor about the size of a walnut. He recovered entirely from the primary effects of the operation. There was absolutely no deformity of the face and the scar which was brought closely under the nose was almost indistinguishable. At the end of three weeks and a half, however, the symptoms of cerebral compression which had been prominent before the operation, began to return and the patient died at the end of five weeks from a recurrence of the growth, which microscopical examination had shown to be malignant. A complete report will be made later, but a preliminary diagnosis of sarcoma was made.

Clinical Report by Dr. Julius Grinker.—Patient, a carpenter, 43 years old, had an attack of gastro-intestinal disease about thirteen years ago, and acute articular rheumatism about eight years ago. Habits were good and there never was a trauma or venereal disease.

Present Illness.—After a searching inquiry it seems probable that the beginning of the present trouble dates back about one and a half years, though definite symptoms had made their appearance only within the past eight months. The earliest symptom in this case seemed to be a few "fainting spells" lasting but a few moments, during which he usually perceived black spots before his eyes. They occurred at irregular intervals and were commonly followed by palpitation and rapid pulse. During the past year dull headaches were frequent and for a period of seven

months intense cephalalgias alternated with the milder headaches, the former often preventing sleep. There were also drawing sensations and peculiar discomfort in the bones and a well-marked apathy and drowsiness.

About the middle of March, 1909, he experienced marked losses of vision, objects appeared blurred and indistinct and he had a sensation as though he was looking through smoke. Indeed, he is certain that for a short period he was entirely blind in both eyes, but imperfect vision slowly returned and then remained stationary. In describing the eye symptoms he placed no emphasis on any existing differences between outer and inner fields of vision. On the part of the mental functions the only complaints were a certain degree of inability for sustained mental concentration and marked reduction in his ability to remember recent events.

Examination.—The appearance of the well-developed man, weighing 177 pounds and measuring 5 feet 10 inches, with large face and head, sluggish movements and slow speech, suggested at first the picture of acromegaly. However, an examination which included careful measurements found hands and feet of normal dimensions. The face seemed a trifle long, the forehead, superciliary ridges, nose and ears appeared rather more prominent than in the average individual. There was a slight degree of prognathism, but no widening of the interdental spaces—a sign first minutely described by Dr. W. W. Graves as indicative of incipient acromegalic enlargement of the maxillary bones. The tongue was not hypertrophied, but speech was of low pitch and monotonous. There was no dribbling of saliva, no kyphosis and no enlargement of the upper end of the sternum, nor any dullness over the same. The sexual organs were normal in development and function. From these findings, both positive and negative, one is justified in concluding that there was a mere suggestion of acromegalic disturbance in the patient.

An examination of the viscera disclosed nothing abnormal. Blood pressure was normal, pulse rather slow, from 50 to 60 beats per minute. The glandular and osseous systems were free from suspicious swellings.

Nervous System.—No irritative motor phenomena or paralyzes of any kind. All reflexes normal. Sensation, coördination and speech normal. Mental tests failed to show any abnormalities. With the exception of the visual apparatus, the special senses were in no wise affected. The pupils responded well to light and also in accommodation.

The ophthalmoscopic examination revealed a general whiteness of both discs, with distinct definition of their borders. Evidences of a past or present papilledema, or choked disc, were certainly wanting. A rough functional test revealed the existence of bitemporal hemianopsia and marked narrowing of the nasal field of the right eye for colors and objects.

The preceding array of symptoms, and particularly the eye-findings, pointed very strongly to the existence of hypophyseal disease. On X-ray examination the sella turcica was found enormously enlarged.

Further Observations.—For a period of three months following the first examination the symptoms remained practically unchanged. As the headaches, previously so annoying to the patient, became less frequent and less intense, it was hoped that the disease had probably become stationary. The patient was subsequently placed under Dr. Allan B. Kanavel's observation with a view to determine the advisability of surgical

interference. During the remission of urgent symptoms neither patient nor physicians were insistent upon operation. However, after a period of about three months there was a recrudescence of all the symptoms, with severe headaches and rapidly failing vision and increasing somnolency. It was at this time that all were convinced that operation was the only remaining remedy.

The following notes were made November 10, 1909, two days before operation: Vision in right eye, both temporal and nasal, completely lost. In the left eye there is vision only in part of the nasal field. Headaches and general aching of limbs are continuous, though not severe. Memory is poor, mentality sluggish, there is difficulty in finding common words for ordinary conversation. In addition there is impatience and irritability. Drowsiness is now constant, although it is still possible to arouse patient. Recurring vasomotor disturbances in the form of profuse sweats and cold extremities have become additional features in the case.

Symptoms following operation have already been detailed by Dr. Kanavel in his remarks on the surgical aspects of this case.

CASE OF HYPOPHYSEAL DISEASE, WITH MANIFESTATIONS OF ACROMEGALY AND SEXUAL INFANTILISM

By D'Orsay Hecht, M.D.

Miss H. B., aged 25 was born in Sweden and came to the United States, joining other members of her family about seven months ago. The following history may be fraught with some inaccuracies because the patient was mentally backward, and neither understood nor spoke the English language. The data had been rather indifferently supplied by a brother and sister.

The family history appeared to be unimportant. Father and mother were living and well. The patient was the third oldest of twelve children, six of whom died during the years of infancy. The living children, with the exception of the patient, were said to be well. There was no definite history of miscarriages on the part of the mother.

At the age of nine the patient first complained of severe headaches, coming on in attacks and further characterized as insidious in onset, diffuse, increasing to great severity, receding by degrees and accompanied at the end by dull, heavy sense of pressure all over the head. Abdominal pains were frequently associated with these headaches, although unattended by nausea or vomiting. Such attacks would last for several days, with free intervals of from two days to a week or a month. Medical advice was sought, but no cause ascribed for the recurrent headaches, which persisted until the patient was twelve years old, when she experienced by far the severest attack she had ever had, again attended by abdominal pain, and it is said delirium and unconsciousness of four days' duration. At about this time the patient sustained some serious contusion to her left hip from a fall on the ice while skating, and for that entire winter could not lie on the affected side. The lameness noted now when she walks, due to some arthritic or ankylosed condition of the left hip, is not at all a part of the disease which has interest, but apparently the result of that trauma.

The menstrual epoch was not established at the usual age, and the menses have never appeared. It is stated that the patient's tendency to increased body growth began, or at least was observed, for the first time when she was twenty-two, and since then it had been particularly noticeable in the feet and hands. The headaches had recurred with increasing severity since the extremities began to grow, and last winter they were most intense, and in the summer of 1909 were again more mild.

Bringing the history down to the more immediate present, Dr. Hecht said that two days prior to the patient's admission to the neurologic service at Wesley Hospital, on November 3, 1909, a most severe headache came on, with abdominal pain, delirium and unconsciousness, lasting for twenty-four hours, when she became rational enough to say that her head ached. The next day she lapsed into unconsciousness again, became irrational, and in this condition was brought to the hospital. During unconsciousness she is said to have had involuntary evacuations of feces and urine.

Upon closer inquiry, it would appear that the unconsciousness referred to was mistaken for deep stupor or marked somnolence, from which the patient could be aroused at least long enough to take notice of her surroundings.

Referring to the physical findings in the case, Dr. Hecht stated that the patient was of slightly more than average height, weighing 145 pounds, and that in the standing position a short-waistedness and sunken appearance of the thorax were readily observed. The hips and pelvic bones did not have their normal prominence, and the calf muscles were quite underdeveloped. The head was not large, nor the face asymmetrical, but the supraorbital ridges were somewhat unequally prominent. Neither the nose nor the lips were thick. The lower jaw was neither protruding nor under-shot. There was no separation of the teeth, nor enlargement of the tongue. The sternum and clavicles were neither large nor thick.

The extremities showed undoubted though not conspicuous enlargement. The hands took the largest size glove and the fingers were elongated and tapering, rather than thick and spade-like. The feet showed more distinct enlargement and thickness than the hands, together with an unusually high and well-curved instep. (Dr. Hecht showed radiograms of both hands and feet.)

The mammary development was most rudimentary and, but for the appearance of the small nipple, entirely absent. The pubic and axillary hair was entirely absent. The heart and thoracic viscera were negative. Upon palpation the abdomen was soft and negative. Gynecologic examination revealed an infantile uterus and adnexæ.

On the part of the nervous system the reflexes were of some interest. They were all brisk, but the knee jerks showed some variability, and, on the whole, the right patellar was considerably more exaggerated than the left, and, in addition, a Babinski sign *seemed* present on the right.

The eye findings were conspicuous because of their entirely *negative* character. The pupils were moderately dilated, equal, slightly irregular, with prompt reactions; there were no palsies, no hemianopsia, no photophobia, no defective vision, and the fundus was entirely normal, with rather marked physiologic cupping.

The urinary findings were interesting in that polyuria had been a constant feature, the patient voiding large quantities with each urination and totaling from eighty to one hundred and twenty ounces daily.

The appetite was poor, but polydipsia was present in marked degree.

The blood pressure had been observed daily for several weeks, both before and during the administration of pituitrin given hypodermically, but the readings were not very reliable, varying anywhere from eighty to ninety-five.

The daily feces and urine had been examined by Dr. S. A. Matthews, who was especially interested in the metabolism phases of the case. Dr. Matthews had made a careful study of the intake and output of the patient under dietetic control, and would no doubt give the result of his study in the discussion to follow. To Miss Brindley, skiagrapher to the Wesley Hospital, Dr. Hecht felt indebted for a most splendid lateral radiogram of the head, showing a well-outlined, markedly enlarged, deeply excavated, but not deformed sella turcica.

Dr. Hecht added that he had seen quite a few anomalies, both as to size and configuration, of the sella, but thought this was quite the largest in point of size and depth that he had seen. The mental state of the patient, marked retardation, and the intellectual development seemed more that of a girl of fifteen or sixteen than of twenty-five.

In an epitome of the case, Dr. Hecht again emphasized the mild acromegaly, the infantilism, the absence of focal symptoms on the part of the eyes, the absence of fat deposits which, together with the present syndrome, would approach more the Froehlich type, the presence of polydipsia and polyuria, the mild imbecility, and the interesting radiogram finding of the sella turcica.

In closing the presentation, Dr. Hecht asked for an animated discussion, bearing upon the case in general, its type, the existence of hypophyseal tumor or disease, in its nature a mere perversion of glandular function, an under- or over-activity of same, and, lastly, the advisability of surgical interference in the presence of the intractable and refractory headaches and reflexes suggestive of central pressure, and significant radiograms of the sella turcica.

Dr. S. A. Matthews said Dr. Hecht's case, which they are now examining from the standpoint of physiology, shows no adrenalin reaction, in fact, the blood is not more than one twentieth as active as normal blood. The urine is rather diluted, four litres in twenty-four hours; it contains a small amount of urea, a small amount of ammonia nitrogen, and a small amount of creatin and creatinin; that is, the nitrogen actually used in the tissues, which is an index of chemical activity, is small. The calcium elimination evidently is interfered with, because the amount of calcium eliminated is not less than normal, which might be expected in this case because of the increased bone formation that is going on. The phosphorus eliminated is also lessened in amount. These findings correspond pretty well with what we ought to find in a case of progressive acromegaly. There is evidently a considerable diminution in the normal chemical activity of the body. Although they had not yet determined the point of carbohydrate tolerance he rather expected to find it low. If the case should be found to be below normal in carbohydrate tolerance, it would indicate that the hypophysis is concerned in the changes presented in this case.

Dr. Sydney Kuh said that reports of cases of infantilism resulting from tumors of the hypophysis are sufficiently rare to justify him in reporting a case of which he could give only an incomplete history. The

patient was seen at a time when it was utterly unknown that such a thing as infantilism might result from tumor of the hypophysis. So far as he could find in the literature, it was the first case in which a diagnosis of infantilism resulting from tumor of the hypophysis was made, although the diagnosis was not made until after the patient's death.

The patient was a boy of seventeen whom he did not see until the symptoms were fully developed. The family history was negative, excepting for the fact that one first cousin died of epilepsy. There were two other children in the family alive and in perfect health. The history of the parents was of no interest. The family physician stated that the malady first showed itself by symptoms attributed to gastric catarrh, vomiting being most prominent, some headache and bradycardia.

When he saw the patient quite a while after the beginning of the disease, he had been examined by Dr. Gradle, who found a marked choked disc, and there were symptoms suggestive of multiple foci of disease in the brain. There was not at any time anything suggestive of hemianopsia. In fact, there was absolutely nothing present of the symptoms which were known at that time to result from tumor of the hypophysis. The boy's growth had ceased entirely with his fourteenth year. At the time of his death—he was then eighteen—there was still not the slightest evidence of the coming of puberty. The fact that there was a very marked infantilism and that none of the other causes known at that time to produce stunted growth were present, led Dr. Kuh to assume syphilis as a cause of the infantilism. Acting on that idea, antisyphilitic treatment was ordered and, much to the surprise of everybody concerned, the boy apparently made a complete recovery. Dr. Kuh was told that Dr. Gradle, on a second examination of the fundus, made at that time, found a great improvement in the conditions present.

After a year of apparently perfect health, the old symptoms returned, he might add after a slight alcoholic excess. Antisyphilitic treatment was resorted to again, but in spite of everything the disease progressed, and after a few months the boy died. The post-mortem showed a tumor of the hypophysis about the size of a pigeon's egg, exceedingly hard, a psammoma, apparently consisting of calcareous deposit with very little connective tissue between.

At that time, seven years ago, it occurred to Dr. Kuh if tumor of the hypophysis could cause increase of the body growth, it would not be absurd to assume that it might also interfere with physical growth. With that idea he searched the literature and found three or four cases reported of pituitary tumor in which there had been noted sexual infantilism and stunted growth. Not one of the authors reporting these cases apparently had thought that this defective development might have been caused by disease of the hypophysis.

The case is interesting, then, not only because it is an instance of infantilism, but also because of the very peculiar and inexplicably apparent cure in spite of the fact that they had to deal with a tumor which apparently consisted of lime salts.

Within the past year or two he had occasion to see the brain of a second case of pituitary tumor, which a surgeon attempted to remove, with fatal results. The patient was a girl of twelve. There had been stunted growth. Since then the number of cases recorded in the literature has increased so rapidly that he is inclined to believe that this

symptom is not an infrequent one. Wherever we see infantilism or delayed sexual development, we may be justified in thinking of the possibility of hypophysis tumor.

Dr. Henry Gradle said he had seen six cases of tumor of the hypophysis without acromegaly, all presenting eye symptoms. One of these cases was the one mentioned by Dr. Kuh, but he thought the diagnosis could not have been made in that case at that time because the eye symptoms were not characteristic. There was no hemianopsia, but optic neuritis with paralysis of the abducens nerve and symptoms which are now called infantilism. He met with the condition in one other instance, that of a gentleman, thirty years old, who had bitemporal hemianopsia with partial atrophy of both discs progressive in one eye. He had a marked leontine face, a very active mind, but pronounced infantilism of the sexual organs.

Another man, aged 22, was under-sized, possibly independent of his disease. The presumable tumor of the hypophysis had caused the characteristic bitemporal hemianopsia with optic atrophy and a widening of the face, the so-called frog's face, which is characteristic of fibroma of the pharynx, although the nares and pharynx were normal. His condition had been stationary for at least two years.

A woman of 29 or 30 had developed the characteristic eye condition, with intense headaches, for about a year before he saw her. The only peculiarity outside of the eye symptoms in her case, and the headache, was the total suppression of the menses. She had not menstruated since the trouble showed itself.

The last case presented only eye symptoms, with absolutely nothing in the way of interference with or exaggeration of growth or other functions.

Dr. George W. Hall has seen several cases of acromegaly, only a few of infantilism. He believes this certainly is not a typical picture of acromegaly and would suggest that it is more like one of infantilism. The fact of her mental condition, the absence of the pubic hair and hair under the arms certainly speak very strongly for the infantile character of the condition. It would be interesting to obtain an outline of the aorta, as it is sometimes found to be narrow, either in the arch or some other portion. Dr. Hall saw one case in Vienna where such a diagnosis was made by Neusser. He described the case in the clinic and his diagnosis was verified at the autopsy. The case did not show all the features of Dr. Hecht's case, but had many of its characteristics.

Many authorities do not place so much stress on the radiogram as was done at one time, as the shadow is likely to be distorted. Therefore the size of the sella turcica in the plate shown by Dr. Hecht might be interpreted variously by different men. On the whole, in Dr. Hall's opinion, this case should be considered one of infantilism rather than one of acromegaly.

Dr. Peter Bassoe would like to say a few words about the histology of the tumor in Dr. Kanavel's case. There is no question about its being malignant, but he would hesitate to call it a sarcoma. The tumor was removed piecemeal, so that the structure naturally is distorted, yet one can see in many places cells arranged in rows, suggesting a tubular and epithelial origin, and in view of the fact that most tumors of the hypophysis are of epithelial origin, he would hesitate very much in saying that this is not an instance of a malignant form of adenoma.

Dr. E. R. LeCount expressed some skepticism concerning sarcomas primary in the hypophysis and reminded the members that the enlargements of the anterior lobe in acromegaly were considered as sarcomas before they were understood. He commented upon the better understanding of prepubertal acromegaly and inquired whether the patient shown by Dr. Hecht had alterations in the thyroid or enlargement of the thymus demonstrable clinically. In reference to the growth removed by Dr. Halstead and so well studied by Dr. Lewis he remarked upon the exceptional features shown by the epithelium of the pars intermedia in its differentiation in tumors; whereas in most instances, as is well shown by the growths studied by Erdheim, the differentiation causes the tumors to resemble the basal cell carcinomas and other growth made up of squamous stratified epithelium—in other instances, as in the growth studied by Dr. Lewis, the differentiation, if it may be so designated, is to columnar cells with the consequence that the tumors resemble the hypernephromas or ovarian cyst-adenomas.

Dr. Sydney Kuh was pleased to hear Dr. Bassoe's statement regarding the pathology of the tumor in Dr. Kanavel's case, since he was called upon by the photographer to point out to him portions of the tumor that would show a typical sarcoma, and, if possible, in the same field a portion of tumor which would demonstrate unaltered hypophyseal tissue, and he must confess to his inability to satisfactorily fulfill either one of the two demands. What little experience he had with hypophyseal tumors leads him to agree with Dr. Bassoe.

As to the division or split referred to by Dr. LeCount, so far as tumors of the hypophysis are concerned he does not believe that the age at which the growth occurs decides the subsequent symptoms. There are a sufficient number of cases on record in which increased growth occurred before the age of puberty. We cannot have a typical infantilism if the tumor develops after full growth of the body has occurred, and still there are a number of cases which seem to suggest that in the adult tumor of the pituitary body may cause an abeyance of the sexual function. It appears to be a common occurrence in tumors of the hypophysis, whether associated with acromegaly or not.

Dr. LeCount asked whether it is not true that in acromegaly developing at the time of puberty patients have peculiar deposits of fat.

Dr. Kuh replied he was not aware of the presence of anything of that kind, although he could not deny its occurrence. So far as he knew, however, it is not a constant symptom.

Dr. Gradle asked whether it has not been noticed either in the course of the disease or during the operation that extreme elevations of temperature are relatively common. It was mentioned by Dr. Halstead that in both his cases the temperature went up higher than one would expect it to go for purely surgical reasons. In a case Dr. McArthur operated on it was stated by him that in a few hours the temperature rose to 107° . Dr. Gradle thought other operators have reported the same occurrence.

Dr. Julius Grinker said he saw Dr. Hecht's case when she was brought to the hospital in a stuporous state. She was irrational, and it was impossible to make an examination. This condition lasted for a day or two; then Dr. Hecht had an opportunity to examine her carefully. It is interesting to note that the internes made a diagnosis of acromegaly because of the large size of her hands and feet. A brother

also has large hands, but shows no symptoms otherwise. It occurred to Dr. Grinker that large hands and feet might be a family characteristic in her case, and that in addition she suffers from infantilism and imbecility.

The radiogram merely shows a large sella turcica, but no tumor. The eye findings are not convincing that there is pressure on the chiasm. Is it not possible that with the enlargement of hands and feet there is also an enlargement higher up in the region of the sella turcica, merely a bony enlargement without any tumor? Certain it is that all we can definitely say now is that the sella turcica is enlarged. Whether there is a growth in the space included between the anterior and posterior clinoid processes, nobody knows.

Personally Dr. Grinker does not favor operation, because he is not convinced that there is a tumor present.

Dr. A. C. Croftan asked Dr. Matthews whether the diet in Dr. Hecht's case was carefully controlled; whether the intake of calcium and nitrogen was carefully measured for a prolonged period of time before any conclusions were drawn from the output. It is futile, otherwise, to establish merely that a certain individual has a variation in the calcium excretion from the normal average. Take a variety of individuals whose metabolism is deranged, as in any ductless gland disease, and one will find that the daily calcium excretion varies, that one individual will excrete more calcium than another, and this quite independently of the diet. As a preliminary one must always know what is the endogenous, the individual factor in each case by placing the subject for several days on a *calcium-free* diet. Then, if we want to determine the effect of any disease upon the calcium metabolism, we can have this endogenous value for a basis, and by adding a definite amount of pabulum containing a known calcium percentage we can arrive at some valid conclusions; provided always that the feces calcium is included in the calculation.

After we have a few hundred such studies, and not before, we will be able to arrive at some definite conclusions.

Dr. Matthews said we cannot control these cases absolutely with reference to the variations that individuals may present in the elimination of calcium or other substances. This patient was placed on Folin's nitrogen diet, and they are going to work it out on that basis. Then they are going to place her on Folin's non-nitrogen diet and make the same determinations before they attempt to draw any conclusions.

Dr. Halstead (closing the discussion on his part) said one point in relation to the clinical history of the patient which he failed to mention before is that the man had lost his sexual power for a year, but it returned after the operation.

The cases he had operated on acted very much like post-operative cases of exophthalmic goiter. Unquestionably, the high pulse and high temperature were caused by hypophyseal juice entering the circulation. The symptoms certainly resemble those of hyperthyroidism.

Dr. Kanavel (closing the discussion) said: In reading over the report of Dr. Cushing's case and the results he obtained, it would seem to him that there was some question as to the propriety of removing a portion of the hypophysis when there was no indication of tumor. He did not believe that the operation is justified at the present time.

Dr. Hecht, in closing the discussion on his part, thought that Dr. Grinker's points were well taken, but nevertheless felt that the patient's prospects for relief should not be so summarily dealt with. After all, there were criteria in the case which merited an attitude more conciliatory or even favorable to operative interference. Dr. Hecht had raised the question of operability too because a patient with acromegaly had only recently been subjected to operation by Cushing, who, in the last December issue of the *Annals of Surgery*, in his report of the case, stated that a tumor was neither suspected nor found, illustrated the ante- and post-operative physical features and discussed the justifiability of operating in the presence of hyperpituitarism, regardless of tumor pathology. The subject was in its earliest infancy and Cushing's result was, in the speaker's opinion, far from reassuring. Dr. Hecht felt that he might eliminate tumor formation and be dealing perhaps with a functional hypersecretion due to actual glandular overgrowth. When Dr. Grinker construed the enlargement of the sella turcica as an integral part of the general body growth noted elsewhere in the skeletal parts, and thought that operation was wholly contraindicated because of the absence of eye symptoms, Dr. Hecht was disposed to differ with him. Only a few days ago he had seen a pontine tumor come to autopsy, having all the appearance of a sarcoma, which had spread over the base, completely eroding the petrous portion of the temporal bone, and invading the entire hypophyseal region and glandular receptacle, without disturbing the chiasm, as the autopsy clearly showed, and leaving the ocular apparatus perfectly intact during life. This would serve to illustrate that considerable invasion may occur in this region without giving rise to focal symptoms referable to the chiasm or optic nerves. It would seem that the intense uncontrolled headaches, the disparity in the reflexes, and the presence of a more than indicated Babinski would offer some grounds for contention in favor of operation, especially when the sella turcica showed so much excavation and enlargement.

As to the patient's brother, he too, had observed him and felt convinced that his hands and feet were not excessively large, but rather in keeping with the rest of his physical development and manual type of work, which was that of a carpenter.

The speaker agreed with Dr. Hall that the acromegaly was not pronounced, and also felt disposed to regard the evidences of infantilism as clinically the more important. Admixtures of the two types, however, have been frequently reported in the literature and if the patient had presented, in addition, much adiposity, the Froehlich type would have been realized.

Relative to Dr. Bradle's observation of six cases without a single acromegalic symptom, the speaker believed that such cases had been reported rather frequently, but the reverse condition, in which it is reported that hypophyseal tumors were absent in known acromegaly, does not hold so good now as formerly, because the recent literature comments upon much overlooked pathology in the hypophysis. Of late even a new type, known as Rachendach Hypophyse, has been referred to several times in the German literature.

Dr. LeCount had properly called attention to an error of omission for which the speaker was grateful. In answer to his inquiry as to the

condition of the thymus and thyroid, he said the former showed no change and the latter was not enlarged. ■

In closing, Dr. Hecht stated that he had seen Dr. Kanavel operate in his case and could subscribe to the excellence of the plan of operation and faultless technic. He furthermore congratulated Dr. Halstead upon achieving such a brilliant result in the patient presented, all the more remarkable for the absence of any external scar or cosmetic blemish.

Periscope

Zentralblatt für Nervenheilkunde und Psychiatrie

(September 1 and 15, 1909)

1. A Case of Dementia Præcox after the Age of 40. OECONOMAKIS.
2. Luetic Psychoses. F. PLAUT.

1. *Dementia Præcox*.—The author reports a case of so-called dementia præcox after the age of forty. Cases of late dementia præcox are not rare and, indeed, are not important enough to be reported in the literature. It is worthy of note that Oeconomakis' case contained many symptoms of general paralysis. His patient had syphilis, and his pupils were small and reacted to light and accommodation rather sluggishly and the tongue was tremulous. Two unsuccessful punctures were made. The author would have done a great justice to himself and to psychiatry if he had supplied us with a complete record of the case including a Wassermann reaction of the blood and cerebrospinal fluid and a cytological examination, which are of great aid in the diagnosis of general paralysis, especially the border-line cases. At all events this case cannot be regarded complete or reliable and therefore for the literature it is useless.

2. *Luetic Psychoses*.—Plaut accepts Kraepelin's two important groups of leutic psychoses—simple syphilitic enfeeblement and syphilitic pseudo-paralysis. In addition to these, he offers the following forms of leutic psychoses: (1) Paranoid forms combined with tabes, (2) paranoid symptomatic picture, (3) hallucinatory confusional state, (4) psychical manifestation, accompanying syphilitic cardiac affections, (5) psychoses whose symptomatic phases resemble manic depressive insanity, (6) mental disturbances due to syphilis as trauma (psychical), (7) mental symptoms occurring on bases of hereditary syphilis in form of psychopathic inferiority. The diagnosis of cerebral lues must be made on the entire disease picture, taking into consideration the neurologic status, serological and cytological examination, and the mental picture. Wassermann reaction and cytological examination are important diagnostic points; the former in cerebral lues is usually present in the blood and not in cerebrospinal fluid while in general paralysis both blood and cerebrospinal fluid give a positive Wassermann reaction. However there are cases with autopsies which gave different results.

(October 1 and 15, 1909)

1. A Psychological Analysis of Dementia Præcox. W. STOCKMAYER.
2. Maupassant. F. LANGE.

1. *Dementia Præcox*.—According to Freud psychology and Jung's association studies, Stockmayer analyzed a case of dementia præcox and found definite complexes which determined the symptomatic display of the disease picture. The case as a whole does not lend itself to review, and, indeed, it would repay to read it in the original.

2. *Psychosis of Maupassant*.—Lange is of the opinion that Maupassant was a mild psychopath, alcoholic and syphilitic, and that he had died from general paralysis and not from cerebral lues.

(November 1, 1909)

1. Cholesterine and Wasserman Reaction (in French). G. PIGHINI.
2. The Dream as Origin of Delusions in Cases of Alcoholic Delirium. D. PACHANTONI.

1. *Cholesterine and Wassermann Reaction*.—Pighini offers the following conclusions: (1) The liver both in a normal and syphilitic fetus contains cholesterine, but in the latter it is 10–15 per cent. more than in the former (0.26–0.31 per cent.). (2) The cerebrospinal fluids of the paralytic, epileptic and dementia præcox, which give the Wassermann reaction, contain all the cholesterine which one is able very frequently to demonstrate with the extract of pure crystallized substances. (3) The liquids which do not give the reaction, contain either no reaction or it is in such small quantities that is not available for the Lieberman reaction. (4) In all probability a causal relation exists between cholesterine and Wassermann reaction.

2. *Dreams in Alcoholic Delirium*.—Pachantoni reports rather poorly two cases of alcoholic delirium which developed delusions from a dream.

(November 15, 1909)

1. Contribution to our Knowledge of the Course and Termination of Manic Depressive Insanity. C. V. HÖSSLIN.
2. Remarks on the Psychology of Compulsive Ideas and Consanguineous Marriage. OTTO JULIUSBURGER.

1. *Manic Depressive Insanity*.—Hösslin made a study of 288 cases of manic depressive insanity and came to the following conclusions: (1) Beyond doubt there are chronic cases of manic depressive insanity in the sense of Schott, incurable forms, which developed from acute attacks. (2) These chronic cases do not terminate in complete dementia, but arterio-sclerosis and senile process may be associated with the original disease. (3) A certain mental defect, in form of emotional debility, can be demonstrated in all chronic cases of manic depressive insanity. (4) If the first attacks occur at the age of forty, the prognosis should be made with great caution. When the attacks last more than five years, emotional stupor can be observed after the disappearance of the acute symptoms.

2. *Psychology of Compulsive Ideas*.—Juliusburger reports a case of psycho-neurosis in which compulsive idea was the prominent symptom which he analyzed according to Freud method and determined a sister-in-law and mother-in-law complex. He is of the opinion that in such a psychoneurosis a circumscribed schizophrenic process is present and, unlike dementia præcox, the entire personality is not distorted. He concludes that "we will be able to attain a deeper understanding of the psychotic process by the guide of sejunction hypothesis, namely the supposition of schizophrenia; indeed we must keep in view the schizophrenic process in the narrow sense, namely the various disturbances of the associative paths and the schizophrenic processes in the wide sense of the word, namely, the transformation and transferring of the psychic energy."

(December 1, 1909)

1. Polyneuritis and Polyneuritic Psychosis on Morphinum Bases. H. HAYMAN.

2. The Question of Heredity in Mental Diseases. ROSA KREICHGAUER.

1. *Polyneuritis and Polyneuritic Psychosis*.—Hayman reports a case of polyneuritis with Korsakoff's syndrome on the basis of morphium intoxication. Alcohol was excluded. In brief, the symptoms were as follows: absent knee and Achilles jerks, hyperesthesia, sluggish pupillary reaction, incontinence of urine and feces, speech and writing were affected. Mentally, patient showed defect in memory and retention, attention disorder, enfeebled judgment, delirious hallucinations, confabulations in the sense of phantastic ideas of grandeur, labile mood, and the impairment of ethical sense. It is interesting to note that the physical signs developed during the morphium indulgence and the mental symptoms appeared after the withdrawal of the drug. Wassermann reaction was negative. The author wishes to classify this case as pseudo-paralysis on the basis of morphium intoxication.

2. *Heredity in Mental Diseases*.—Kreichgauer made a study of heredity in 139 cases of psychoses and agrees with Vorster, Sioli and others that in dementia præcox and manic depressive insanity the heredity is of a specific nature.

(December 15, 1909)

1. *Apropos of the System of Functional Psychoses*. JULIUS SCHROEDER.

2. The Psychological and Clinical Aspects of Somato-Autopsychoses. ED. HIRT.

1. *System of Functional Psychoses*.—Schroeder states that a psychological system (not in the sense of Freud-Jung school) is of great importance for an understanding of functional psychoses. Brain anatomy and physiology (save that part of physiology which has something to do with psychology) are of no value to the psychiatrist.

2. *Somato-autopsychoses*.—Hirt offers a long discussion on the psychology of somato-autopsychoses in the sense of Wernicke. He describes a case which presented the following symptoms—a feeling of unreality, marked anxiety, peculiar bodily sensations, a high degree of uneasiness, dream-states and recurrence of the attacks. The author considers this case as manic depressive insanity.

M. J. KARPAS (Berlin, Germany).

Book Reviews

L'ANALYSE DES RÊVES (THE ANALYSIS OF DREAMS). C. J. Jung. (L'Année Psychologique, Vol. XV, 1909.)

This article is an exposition of the views of Freud on dreams. The dream, far from being a mélange of accidental and insensible associations, as is ordinarily believed, or due solely to somatic sensations received during sleep, as many authors pretend, is an autonomous product from the mental activity and accessible to systematic analysis like all other psychic functions. The organic sensations during sleep are not the cause of the dream, they play only a secondary rôle and furnish only the material for the psychic work. According to Freud, the dream, like all complex psychic products, is a creation, a work which has its motifs, its chains of antecedent associations, and the same as a reflex action resulting from reasoning, from the concurrence and the victory of one tendency over another, the dream has a significance as each of our acts. One may object that the reality of empiricism is opposed to this theory because of the impression of incoherence and obscurity that dreams make on us. Freud calls this series of images the *manifest content of the dream*, it is the façade behind which one finds the essential, that is to say the idea of the dream, or the *latent content*. This idea that the dream is only the façade is the result of the experience that no psychic fact is accidental, it always has its chain of causes, it is always the product of complicated associated phenomena. Because each mental element is always the result of anterior psychic states it should theoretically be analyzable.

Freud says *all dreams represent the accomplishment of a repressed desire*. If we can not accomplish a desire in reality we realize it at least in fantasy. The religions and philosophies of all peoples offer the best proofs. The desires which form the idea of the dream are not desires that one avows openly but desires repressed because of their painful character, and because they are excluded from consciousness in its watchfulness they surge up in dreams.

Naturally if we ask some one why he has had this or that dream, what are the secret thoughts that it has expressed, he will not be able to reply. He will tell us that he ate too much, that he lay on his back, that he saw or heard this or that the day before. As to the idea of the dream he does not know and can not know because this idea he has repressed because of its disagreeable qualities. The dream disguises the repressed complex in order to prevent it from being recognized. Freud calls this mechanism the censorship.

In examining cases the resistance of the complex to being uncovered is very great. If direct questions are put there is almost always no result. The practical method of procedure is as follows: One chooses a specially striking part of the dream and questions the subject on the associations of ideas that are produced by it. He is instructed to tell frankly all that comes to him in the way of ideas apropos of this part of the dream, eliminating so far as possible all critique. The critique is nothing else than the censor, that is to say the resistance against the com-

plex which tends to suppress that which has the most importance. It is necessary that the subject say absolutely all that passes in his mind, without applying his attention. The beginning is always difficult, above all in the introspection examination when the attention can not be suppressed to the point of paralyzing the effect of the censor.

Two cases are analyzed as examples of the method.

WHITE.

DEMENTIA PRÆCOX WITH ALCOHOLISMUS CHRONICUS. Eine klinische Studie über Demenz und chronisch paranoide Psychosen scheinbar alkoholischer Natur. Von Dr. med. Karl Graeter in Basel. Johann Ambrosius Barth, Leipzig. 6 Marks.

The simultaneous occurrence of, or the superposition one upon another, of different psychotic states has been too much neglected by most teachers of psychiatry. It is a commonplace of general medicine, why not of mental disorders? But the analysis of mental symptoms has been so much more elusive that it has been only within comparatively recent years that sufficient definite criteria were at hand to justify a number of the recent studies, particularly of Schröder, Ræcker, Bonhöffer, White and others. The author first presents a number of case histories, grouping them as hebephrenic, katatonic and paranoid forms and then propounds the questions—(1) wherein the picture of chronic alcoholism and dementia præcox are alike, (2) wherein they are different, (3) in what manner the picture of dementia præcox is altered by the incoming of alcoholism and (4) how is alcoholism influenced by dementia præcox and (5) how can one recognize the presence of dementia præcox in an alcoholic. Needless to say these are important practical questions.

That there are many similarities in the two symptom pictures no one doubts and the demented states with hallucinosis offer many analogies to the præcox terminal states. As to the differences these are so well brought out by the Kraepelian studies that it is unnecessary to repeat them: one symptom of alcoholism, *i. e.*, the expansive humor is rarely seen in the præcox. The memory defects of the alcoholic stand out most markedly as Rüdin has well shown. Alcoholic ideas of jealousy are characterized very largely by their singleness, their narrow fixity, but Bonhoffer and Werner have both described cases of non-alcoholic origins.

Korsakow's psychosis, alcoholic pseudoparesis, and alcoholic senile dementia do not resemble dementia præcox in many particulars and are easily separated. Chronic hallucinatory dementia of Kraepelin offers the chief ground for stumbling. Here the peculiar will disturbances of the katatonic are rarely seen and constitute the chief diagnostic feature.

The dissociating influence of alcohol on the præcox case is very marked as a rule. All of the usual præcox reactions are increased under the alcoholic stimulation and in the later stages the usually good memory of the præcox case is destroyed by the alcohol. As for the influence of dementia præcox on alcoholism one has similar retrograde changes.

Every case of alcoholism should be checked up for dementia præcox and in all precocious demented who drink attention should be paid to the alcoholic factors.

The author calls particular attention to the lack of precision of a number of ideas concerning chronic alcoholic psychoses, particularly does he doubt the existence of a pure alcoholic paranoia in the sense of Krafft Ebing. From the multiplicity of names given to similar conditions by

numerous European students it is evident that the matter is in need of careful sifting. This is one of the best pieces of work along this line and can be studied to great advantage.

JELLIFFE.

LA CYCLOTHYMIE. De la constitution cyclothymique et de ses manifestations (Depression et excitation intermittentes). By Dr. Pierre-Kahn, Ancien interne des hôpitaux de Paris et de la Salpêtrière. Préface de M. G. Deny, médecin de l'hospice de la Salpêtrière.

In 1 vol. of 252 pages with illustrations. G. Steinheil. Paris, 6 fr.

This study is an extremely readable one. The mild manifestations of manic depressive insanity have been thought of from a variety of points of view, and it cannot be said that the present author has contributed very much to the fundamental understanding of the question, but he has brought into the foreground certain facts which need to be emphasized. He believes that there exists a psychopathic constitution characterized by modifications of the mood, which alterations show a more or less regular intermittent or circular course. It is to this temperament or constitution that he applies the word "cyclothemie." It is often founded on a hysterical basis, commences usually in adolescence, and manifests itself, within general limits, in three grades, the light, the medium and the severe. The light manifestations are hardly anything more than an exaggeration of so-called normal states. Such patients are often simply termed "lunatic" or "originals." Those that show the symptoms of the mild grade manifest an evident psychosis and which, up to the present time, have been described as cyclothemies. The grave manifestations he would ally with the manic depressive states of Kraepelin.

The thesis is an interesting one. The author comes somewhat in the van of work already done by German psychiatrists. In the psychopathic constitution of Kraepelin and of other German psychiatrists may be found all the facts which are gathered together in this monograph, which however presents the matter from the French point of view, and is well worth reading on this account, if for no other.

JELLIFFE.

DE L'AUTOMUTILATION, MUTILATIONS ET SUICIDES ÉTRANGES. Dr. M. Lorthiois, Ex-Interne de l'Asile d'aliénés d'Armentières. Vigot Frères, Editeurs, Paris.

Of all of the curious acts committed by the mentally disordered the most striking are those consisting of mutilation of their bodies. There was a time when such terms as suicidal or homicidal mania were in use to describe the mentally ill who perpetrated such horrors, but fortunately the time has gone by, for most at least, when any such appellation meant anything fundamental. It still lingers in medico-legal parlance much to the dissatisfaction of those who would like to see the legal profession better acquainted with the teachings of the present century, so far as the psychoses are concerned.

The present monograph of some 257 pages discusses the subject from the historical and literary point of view and draws copiously from modern sources in illustrating the types made famous by literateurs.

We know of no monograph dealing with the subject in as interesting and practical manner and commend it cordially to our readers.

KARPAS.

The Journal OF Nervous and Mental Disease

Original Articles

DEAFNESS DUE TO LESIONS IN THE BRAIN

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Total bilateral deafness due to lesions in the brain appears to be an exceedingly rare symptom, for very few cases are to be found in the literature of neurology in which it has been present. It is well known that the cortical centers of hearing lying in the temporal convolutions receive impulses from both ears and hence a lesion in one hemisphere is not necessarily attended by total deafness. A few cases have been recorded in which lesions in both temporal lobes have occurred and have resulted in a state of total deafness, but in all these cases (and they are not many) the lesions in the two hemispheres have not occurred simultaneously, and hence the patient has not been suddenly afflicted with total deafness. There is, however, a sufficient number of cases on record with autopsies to prove that when both temporal lobes are destroyed by disease a patient will necessarily be totally deaf.

The connection between the temporal lobes and the termination of the acoustic nerves in the medulla and pons is now well known. The primary centers in which the acoustic fibers end lie at the junction of the medulla with the pons and consist of several groups of cells lying partly upon the floor of the fourth ventricle and partly deep within the formatio reticularis. From these centers tracts arise which pass upward to the cortex, forming the central acoustic tract. Like all sensory tracts the acoustic tract is not a continuous one, but is made up of a series of

short fibers with intercalated neurones. The chief decussation of this tract occurs low down in the pons in the trapezoid body, but this decussation is not a complete one and hence each acoustic tract conveys impulses from both ears. That this tract is not a continuous one from the nuclei of origin to the cortex may be deduced from the very large number of reflex acts which any auditory impulse will produce. A loud sound upon one side causes an involuntary start, a turning of the head toward that side; a turning of the eyes toward that side, and not infrequently a sudden dilatation of the pupils and, in addition to these reflex acts, processes of thought are arrested and attention is fixed upon the sound. It is thus evident that the auditory impression is capable of setting up a large number of automatic acts as well as of exciting cortical activity; a fact which implies an interrupted and not a continuous tract.

Investigations of Held,¹ Thomas² and Van Gehuchten³ have shown that the course of this central acoustic tract is chiefly in the lemniscus, or fillet, in its lateral portion and that it has connections with the upper olive, with the nucleus of the lemniscus, with the corpus quadrigeminum posterior, with the corpus geniculatum internum and with the temporal convolutions.

Such being the course of the acoustic tract, it is to be expected that lesions in the pons varolii and in the tegmentum of the crura cerebri which affect the lemniscus should produce deafness, but cases of this kind appear to be extremely rare. For this reason the following case is recorded:

CASE OF AN APOPLECTIC ATTACK CHARACTERIZED BY ALTERNATING PARALYSIS OF MOTION AND OF SENSATION, BY DYSARTHRIA, AND BY TOTAL DEAFNESS IN BOTH EARS.

The patient, whose arteries had become markedly atheromatous, from a long-continued abuse of alcohol, had a slight attack of right hemiplegia and aphasia in the year 1900, when 42 years old. The symptoms rapidly subsided and as the attack was not attended by loss of consciousness, it seemed probable that it was due to a thrombosis in a small vessel, leaving a focus of sclerosis of small extent and without permanent effects. In June, 1901, a second apoplectic attack, however, occurred, more severe in

¹ Held, Arch. f. Anat. und Phys., 1893.

² Thomas, Comptes rend. de la Soc. de Biol., 1898, p. 183.

³ Van Gehuchten, Le Nevraxe, IV, 280, VIII, 58 and 127.

character, the permanent symptoms of which remained until her death in 1909. In this attack she became unconscious and remained so for two days, after which time it was apparent that the right side of her face was paralyzed and that the left arm and leg were paralyzed. The face was flat and it was drawn toward the left side. The right eye could not be firmly closed. The right side of the face was wholly expressionless and saliva drouled from the right corner of the mouth; the tongue was paralyzed and protruded toward the left; the left arm and leg were quite paretic. Sensation in the right side of the face was markedly impaired to touch, temperature and pain, and the same loss of sensation was apparent in the left arm and left leg and upon the left side of the body as high as the collar. The right extremities were also slightly weaker than before the attack.

In addition to the alternating paralysis and anesthesia, there was a very marked loss of muscular sense and this was present in all four extremities, being more marked on the left side. The patient was unable to swallow and choked at any attempt, so that she was fed for a month with difficulty. She was entirely incapable of pronouncing words distinctly and as time went on this difficulty increased, being intensified by her total deafness.

From the day of the attack until her death *she was totally deaf in both ears*. The deafness was complete for all sounds, high or low, and there was no bone conduction of sound. A very loud jangling bell rung behind her caused a sense of uneasiness so that she would move her body restlessly and become aware that something disagreeable was happening. But this was evidently felt as a vibration, because it was not referred to the ears and was not heard. There was no disease of the ears, as determined by Dr. Gorham Bacon. This condition was present for eight years. There was apparently no return of hearing whatever. Articulation was imperfect and it was difficult to understand her as she was unable to enunciate with any clearness.

When last seen in July, 1909, the right side of the face was flat in its lower part, especially when she was fatigued, but the eyes closed normally. She constantly drouled in the right side of the mouth. The tongue protruded straight; swallowing was quite easy, though occasionally she had fits of choking. There was marked paresis of the left arm and leg, the left arm being constantly in a state of contracture, flexion of the elbow, of the

wrist, and of the fingers being present. The leg was in a state of contracture, extended, the foot and toes being markedly extended, but the great toe being constantly dorsally flexed. There was exaggeration of all reflexes; Babinski and Oppenheim reflexes marked on left side. The condition of alternating anesthesia to touch, temperature and pain remained until her death.

There was very marked ataxia in both legs. She was unable to stand alone and any attempt at walking resulted in the most extreme ataxic movements of the legs, more marked upon the left side than upon the right. The legs were thrown in different directions, she did not know where they were and could not guide them unless she watched them and then the guidance was very imperfect. There was considerable ataxia of both hands, much more marked in the left than in the right. She could not perceive accurately, or reproduce positions given to the left fingers.

She was perfectly intelligent, was able to write, and had been able to write from the time of the attack, showing that the condition of disturbance in speech was one of dysarthria and not of aphasia. She read, and understood everything conveyed to her in writing, and by the deaf and dumb finger speech. She was consistent in all her statements. She was in no sense hysterical, and a careful daily observation during four months and occasional observation during eight years convinced me that there was no element of hysteria in the condition of deafness. She died suddenly in a uremic convulsion. No autopsy was allowed.

Diagnosis.—The syndrome of alternating paralysis and anesthesia is characteristic of a lesion in the caudad portion of the pons, in one lateral portion. In this case it must have been upon the right side. The lesion must have affected the pyramidal motor tract in the ventral part of the pons to cause the hemiplegia. It must also have affected both the lemniscus and the formatio reticularis in the dorsal part of the pons to produce the ataxia and the alternating anesthesia. I showed in 1884⁴ that the tract of muscular sense passes in the lemniscus and that the tracts of tactile sense, pain and temperature senses pass in the formatio reticularis. The condition of ataxia present in this patient was similar to that recorded in the cases of Senator,⁵

⁴ JOUR. OF NERV. AND MENT. DIS., July, 1884.

⁵ Archiv f. Psych., XIV, 2.

Kahler⁶ and Pick and Spitzka⁷ in which cases the lesion was limited to the lemniscus. But in my patient the ataxia affected to some extent both legs, indicating that the lemniscus was affected on both sides of the median line. The lemniscus lies near to the deeper part of the pons behind the motor tract.

Dysphagia and anarthria are due to lesions in this locality. Markowski,⁸ in a careful study of the symptoms of anarthria due to pons lesions, attempts to separate sharply between lesions in the ventral and lesions in the dorsal part of the pons, the former causing chiefly motor symptoms of a hemiplegic, unilateral or alternating nature, or possibly bilateral hemiplegia, as in his case. He affirms that dysphagia is due to lesions in the median and dorsal part of both pyramidal tracts in the pons, the speech tract being presumably bilateral, because left unilateral lesions destroying the pyramidal tract do not always cause anarthria, while if such a lesion is present and a second lesion occurs in the right side (as in his case) anarthria appears. The same course is taken by the tract which controls swallowing. For while swallowing is largely reflex and is possible so long as the medullary nuclei are intact, it is usually initiated by a voluntary impulse, and if the tract conveying this impulse is affected, difficulty in beginning the act appears. This was the form of dysphagia present in my case. If she attempted to swallow voluntarily she choked. If the mind was diverted and food taken automatically there was no difficulty. His statements being based upon a careful study of the situation of the lesions in his case may be accepted. He cites 18 cases of unilateral pons lesion. In 10 there was no dysarthria. In two of the remaining 8 the record is imperfect. In 6 dysarthria was present, 3 being on the right and 3 on the left side. In 9 cases of bilateral lesion anarthria was present in all. In none of his cases was deafness present.

The pons lesion seems to afford an adequate explanation of the deafness. We have already seen that the auditory tract decussation is in the trapezoid body, its fibers passing across the raphe around the location of the lemnisci. A lesion which affected both lemnisci in my patient could not fail to have involved both auditory tracts at their decussation and hence would arrest impulses from both ears. That the nuclei of the

⁶ Vierteljahrschrift f. Pract. Heilk., Bd. 142, 596.

⁷ Amer. Jour. of Neurology and Psychiatrie, November, 1883.

⁸ Arch. f. Psych., XXIII, p. 381.

acoustic nerve were not affected seems to be indicated by the fact that when a very loud noise was made behind the patient she would move her head reflexly without knowing why and would feel a sense of discomfort. This would seem to show that sensations reaching these nuclei through the nerve caused reflex impulses to the spinal accessory and cervical centers but failed to set up an impulse sufficiently strong to overcome the break in the auditory tract.

The question of the nature of this lesion seems easy to determine. A thrombus in one of the branches of the basilar artery which enter the raphé of the pons and send their branches laterally into its structure, might easily produce an area of softening and sclerosis, affecting the median part of the pons and its right half in the caudad portion.

The following cases have been found in literature to confirm this diagnosis and to prove that a lesion of the pons may cause deafness. As they were all unilateral and did not affect the decussation of the auditory tract the deafness in all these cases was unilateral.

Case 1.—In a case described by Miles⁹ a hemorrhage in the left half of the pons, involving the nuclei of the v, vii and viii nerves and the lemniscus and pyramidal tract, caused alternating paralysis and anesthesia and total deafness in the left ear.

Case 2.—Miles also recorded¹⁰ a case of tumor of the left half of the pons, producing similar symptoms.

Case 3.—In a case described by P. F. Becker¹¹ of an infiltrating glioma of the pons deafness was present. The patient suffered during ten months from progressive symptoms. Vomiting and vertigo first appeared; soon after right vii n. and right vi n. paralysis with optic neuritis followed. Then difficulty in articulation and in swallowing with loss of taste, and paresthesia in the mouth appeared. Then the right v n. was paralyzed with inability to chew. A general weakness of the extremities with ataxia and finally marked anesthesia developed. *The hearing was diminished in both ears, but the right was deeper than the left.* The autopsy showed an infiltrating glioma affecting the right half and median portion of the pons and compressing all the tracts. It projected into the fourth ventricle.

Case 4.—In a case described by Warfvinge¹² of a gelatinous infiltrating tumor of the medulla on the left side there was deaf-

⁹ Archives of Medicine, Aug., 1882.

¹⁰ Archives of Medicine, Oct., 1881.

¹¹ Arch. f. Psych., XXXV, 503.

¹² Neurol. Centralbl., 1889, Vol. VIII, p. 461.

ness in the left ear. The patient suffered from vertigo, vomiting and headache, from paralysis of the left vi and vii nerves, and of the right arm and leg. The tongue protruded to the right.

Case 5.—In a case described by Glaezer¹³ of a tumor in the posterior and lower part of the fourth ventricle which had compressed the pons there was deafness in both ears, especially marked in the right ear.

Case 6.—In a case recorded by Ranschoff of softening in the dorsal part of the pons involving the lemniscus on the left side the motor, ataxic, articulatory symptoms resembled those present in my patient. Unfortunately no mention is made of the condition of hearing although hallucinations of hearing were present.¹⁴

Case 7.—In a case described by v. Bechterew in which the dysarthria resembled that in my patient no tests of hearing are recorded.¹⁵

Case 8.—In a careful study of pons lesions by Dana¹⁶ nine cases are recorded which present typical symptoms of lesions of the pons some being hemorrhages, others foci of softening. In one only of these cases is any record found of the condition of hearing; in that one the patient was slightly deaf in the left ear and in this the lesion was an extensive softening in the left side affecting the lemniscus.

Case 9.—In a case described by Babinski and Nageotte¹⁷ of softening in the interolivary tract and lemniscus on the left side due to thrombosis of branches of the basilar artery the symptoms in many respects resembled those in my patient. There was a marked "hemiasynergie" of the left leg, lateropulsion toward the left; tremor of the upper extremities, right hemiplegia and hemianesthesia, difficulty of deglutition. The patient walked with help only, both feet being markedly ataxic especially the left foot. In this history there is no mention of the condition of hearing but the lesion did not affect the lateral part of the lemniscus in which the auditory tract is supposed to lie.

Case 10.—Moehi and Marinesco¹⁸ have recorded a case of lesion in the dorsal half of the pons, and have collected 15 other cases similar to their own. The symptoms present were permanent paresthesia in the entire left side of the body, diminution of pain sense and temperature sense without total loss of touch, inability to locate the position of the limbs, some ataxia of the left hand, uncertainty in the gait, vertigo, no paralysis of the limbs, left unilateral paralysis of the jaw and slight right sided abducens and facial paralysis which finally disappeared. The lesion lay in the right half of the pons, in its dorsal part,

¹³ Deut. Med. Wochens., 1897.

¹⁴ Arch. fur. Psych., XXXV, 413.

¹⁵ Deut. Zeit. für Nervenheilkunde, XVII, 223.

¹⁶ N. Y. Medical Record, Sept. 5, 1903.

¹⁷ Icon. photo. de la Salpêtrière, Vol. XV, p. 492, 1902.

¹⁸ Arch. f. Psych., XXIV, 666.

not reaching the raphe, nor the floor of the ventricle but involving chiefly the formatio reticularis and to a small extent the lemniscus in its median portion opposite the vi n. nucleus. In this case hearing was not affected; there was no dysarthria or dysphagia.

Conclusions.—From a review of these cases it may be concluded that: (1) Deafness may be produced by lesions of the pons varolii; (2) the deafness will be on the side of the lesion if the acoustic nucleus only is affected; (3) the deafness will be bilateral if the trapezoid fibers are involved at their decussation in the raphe; (4) the deafness will be on the side opposite to the lesion if the superior olivary nucleus and the lateral part of the lemniscus are affected in the pons.

As to the effect of lesions in the auditory tract above the pons, very few data are available. We have already seen that anatomists trace the portion of the lateral lemniscus which conveys auditory impulses into the corpus quadrigeminum posterior and into the corpus geniculatum internum.

Weinland¹⁹ has made a collection of 27 cases of lesions of the posterior corpora quadrigemina. In 13 of them deafness was noted, these being all cases in which the lateral lemniscus was involved in the lesion. In some cases the deafness was bilateral, in others it was on the side opposite to the lesion. He is inclined from the study of his own case and of those of Ferrier²⁰ and of Ruel²¹ to believe that a lesion of one corpus quadrigeminum posterior causes deafness in the opposite ear. In his case the right ear became gradually deaf, not from any ear disease, and the tumor had destroyed the left lateral lemniscus. In the case of Ruel the same was true. In the case of Ferrier the tumor destroyed the right corpora quadrigemina posterior and lateral lemniscus and the left ear was deaf.

In the 14 cases of lesion of the posterior corpus quadrigeminum in which no deafness was found, he shows that either the lesion did not reach the lateral lemniscus or there was no record of an examination of hearing.

Oppenheim and Bruns in their works on brain tumors reproduce these statements of Weinland but do not add any observa-

¹⁹ Arch. f. Psych., XXVI, 375.

²⁰ Ferrier, Brain, 1882, April.

²¹ Ruel, Neurol. Centr., 1890, p. 192.

tions of their own and I have failed to find in literature any study of lesions of the corpora quadrigemina posterior except that of Weinland.

A similar lack of observations is encountered when an attempt is made to trace by pathological records the course of the acoustic tract through the corpora geniculata interna and thence to the temporal lobes. The investigations of von Monakow of the connections of the optic thalamus by the experimental methods upon animals prove conclusively that the corpora geniculata interna send their fibers to the cortex of the temporal convolutions. Limited lesions of these bodies or of the tracts proceeding from them are rarely if ever observed in man, hence we must be content with relying exclusively upon the facts afforded by anatomy and physiology for our data. There is every reason, however, to believe that some future observer will establish the fact that partial deafness of the opposite ear may be caused by a lesion of the corpus geniculatum internum or of its radiation outward to the temporal lobe.

It seems somewhat superfluous to state that central deafness, by which I mean deafness due to a lesion of the auditory tract, may develop either suddenly, as the result of a vascular lesion, or gradually, as the result of a tumor. Yet this assertion seems necessary in view of a recent article by Cornet²² who divided sudden deafness into two categories only; first, febrile, due to purulent inflammation in the labyrinth, and, second, afebrile, which he says may be caused either by wax in the ear, by syphilitic lesions of the labyrinth or by hysteria; thus ignoring entirely the possibility of a nerve lesion.

That a gradually advancing deafness of nervous origin and due to lesion in the auditory nerve from atrophy of its ganglionic cells of origin in the labyrinth may occur, especially in connection with tabes, has long been recognized clinically, though pathological proof has only recently been forthcoming, as shown by Bruhl²³ and Hammerschlag.²⁴

In conclusion it is evident that it is possible to divide the pathology of deafness into four definite categories, each having characteristic symptoms of its own, and each being inevitably

²² Archives gen. de Méd., 1906, II, p. 2329.

²³ Zeitschrift für Ohrenheilkunde, LII, 232, 1902.

²⁴ Zeitschrift für Ohrenheilkunde, LVI, 126, 1906.

associated with other symptoms which aid in determining the location of the lesion: (1) Labyrinthine deafness with associated vertigo; (2) acoustic nerve deafness from primary atrophy or associated with tabes; (3) central acoustic tract deafness, associated with symptoms of pontine or crural symptoms; (4) cortical deafness, usually associated with aphasia and presenting the symptom of psychical deafness.

FRIEDREICH'S ATAXIA¹

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Friedreich's ataxia has been considered usually as a disorder confined to the spinal cord and cerebellum, but more thorough study reveals alteration of the cerebrum, peripheral nerves and muscles. The heart frequently has been found diseased, and was so in the case reported in this paper. It seems probable that careful examination would show more extensive implication of the body than is supposed to exist in the family diseases of the nervous system. The relation of the various family organic nervous diseases to one another is a question also worthy of consideration; and muscular dystrophy may be closely related to them. In some instances when the cerebellum in Friedreich's ataxia appears to the naked eye to be normal, microscopical study reveals great alteration of its nuclei. The cells of the anterior horns of the spinal cord may present degenerative changes. Fatty degeneration detectable within the muscle fibers by the Marchi stain; degeneration of the sensory roots of the trigeminal nerves; the presence of numerous naked axis cylinders shown by the Bielschowsky stain in the greatly degenerated columns of Goll, are findings obtained in the case reported in this paper, and so far as I know, not previously observed. There is need of explanation for the integrity of sensation when the posterior columns are so greatly altered.

The following notes were taken while the patient was in the service of Dr. Mills and from my observations after the death of the patient. She was in my service five days after I came on duty at the hospital.

¹Read at the thirty-sixth annual meeting of the American Neurological Association, May 2, 3 and 4, 1910.

H. McC—, laboratory number 514, female, white, age 24 yrs.; was admitted to the Philadelphia General Hospital, December 19, 1909, and died January 5, 1910. Her father died at the age of 57 from uremia. Her mother died from insanity. Two brothers are living; one sister died in childhood, and was physically defective. One of the patient's near relatives had the same peculiar gait that the patient had. A paternal uncle was paralyzed.



FIG. 1. Spinal cord from a case of Friedreich's ataxia (on the left), (Case I.). Compare this with the normal cord on the right.

The symptoms were first noticed when the patient was 7 years old. She staggered then as though drunk and the staggering increased gradually. At the age of 10 she was able to stagger around and run a little; she could still walk when 12 years of age, and when 15 years old was able to walk by supporting herself

by leaning against objects. She had not been able to walk since she was 18 years of age. She has never had pain, except recently while in the hospital, when she complained of pain below the knees. The pupils are equal and regular; the irides react to light and in convergence. The eyeballs show incoördination in following an object. Intelligence is not very good. Her speech is defective and slow, and articulation is poor. The muscles of the upper limbs appear unusually well developed, and yet these limbs are very weak. The condition suggests pseudomuscular hypertrophy. When she is told to put a finger of either hand to the nose she raises the upper limb to about a right angle with the trunk, and the hand then falls to the nose with much ataxia, as though she had not the power to control its movements. The grasp of each hand is weak. The upper arms are proportionally better developed than the forearms. The heart sounds seem to be normal. Pain, temperature and tactile sensations are normal everywhere so far as they can be determined from the impaired mentality.

The lower limbs are entirely paralyzed and flaccid, and the patient can not move them in bed. The thighs are well developed, but the legs below the knees are distinctly wasted. The sphincters of the bladder and rectum are not implicated. The patellar reflexes are absent. Babinski's reflex is positive on each side. The peculiar deformity of the big toe, characteristic of Friedreich's ataxia, is distinct on the right side, less distinct on the left side. The Achilles reflexes and the biceps and triceps tendon reflexes are absent. The feet are in the position of talipes equino-varus.

The necropsy was performed by Dr. H. S. Wieder. I take this opportunity of thanking him for the care with which it was performed, as it is owing to him that pieces of many peripheral nerves and muscles were obtained.

Pathological Diagnosis.—Dilatation and cloudy swelling of the heart, moderate edema of the lungs, anemic infarct of the kidneys, acute nephritis, congestion of the pancreas.

The heart is about half again the normal size. The right auricle is distended with a blood clot. The heart muscle is normal in thickness but pale. The tricuspid and pulmonary valves are normal. The left ventricle is markedly dilated but the muscle is normal in thickness. The mitral and aortic valves are normal. The aorta and coronary arteries are normal.

The posterior roots to the naked eye are very much smaller than the anterior roots everywhere in the cord.

The brain, after it has been in 10 per cent. formalin a few weeks, and small pieces have been taken from each paracentral lobule, from one lateral cerebellar lobe, and from the medulla oblongata, for microscopical examination, weighs 1224 grammes.

The spinal cord and medulla oblongata are exceedingly small, but the cerebellum is of good size.

The upper part of the ascending frontal and the ascending parietal convolutions are narrow, especially on the right side of the brain.

Sacral and Lumbar Regions.—The posterior roots are much degenerated and when they are stained by the Weigert hematoxylin method very few nerve fibers are present. Clarke's columns are absent. The posterior columns are much degenerated, except in the anterior portion next to the gray matter, and the degeneration extends to each posterior horn. The posterior horns do not contain nearly so many fibers as normally should



FIG. 2. Section from the lumbar region in a case of Friedreich's ataxia (Case I). The posterior columns are much degenerated.

be present, and those found within them come chiefly from Lissauer's zones. The crossed pyramidal tracts are slightly degenerated. The anterior columns are normal. The cells of the anterior horns are about normal in number, and most of them are well formed, but in a portion of the lumbar region some much altered cells are found; in these the nucleus is swollen and the chromophilic elements and dendritic processes have disappeared. A fairly large number of axis cylinders are found throughout the posterior columns, even in the most peripheral part, by the Bielschowsky method. The posterior lumbar roots by this method show many fine axis cylinders.

Midthoracic Region.—The right direct pyramidal tract is degenerated. The crossed pyramidal tracts and direct cerebellar

tracts are much degenerated. Gowers's tracts are not affected. The posterior columns are much degenerated, and the degeneration leaves only a few normal fibers close to the posterior horns. Lissauer's zones are intact. The posterior roots are much degenerated, but not as much so as are those in the lumbar region, and in neither region can the fibers preserved be considered as very fine. Sections obtained by Mallory's neuroglial method show dense sclerosis in the anterior half of the posterior columns, and the "tourbillons" described by Dejerine and Letulle are numer-



FIG. 3. Section from the mid-thoracic region in a case of Friedreich's ataxia. (Case I.) The posterior columns, the crossed pyramidal tracts, the direct cerebellar tracts, and the right direct pyramidal tract are much degenerated.

ous. The central canal is a slit elongated antero-posteriorly. In each posterior horn where the column of Clarke should be is an area of dense neuroglia corresponding in size to this column, and fairly well defined. Longitudinal sections through the columns of Goll, from which the remainder of the posterior columns had been removed, in the lowest thoracic region stained by the Bielschowsky method, show many axis cylinders. In the posterior part of the sections the axis cylinders are longitudinally arranged, but in the more anterior part of Goll's columns they run obliquely, transversely and longitudinally, and form more or less of a felt-work, because of the "tourbillons." There are few axis cylinders in the extreme posterior part of the sections, but many in the middle and more anterior part of Goll's columns.

Cervical Swelling.—The posterior roots are much degenerated, but not nearly so much as in the lumbar region. The anterior roots are normal. The columns of Goll are much degenerated but contain a few scattered nerve fibers, too few for any function as shown by the Weigert hematoxylin stain. The columns of Burdach are moderately degenerated. The direct cerebellar and crossed pyramidal tracts on each side are moderately degenerated. Gowers's tracts are intact. Degeneration of the right direct pyramidal tract is distinct, the left tract is intact. The cells of the anterior horns do not appear so numerous as in most spinal cords, but are well formed. The pia and blood vessels of the pia are not affected anywhere in the cord.



FIG. 4. Section from the cervical region in a case of Friedreich's ataxia. (Case I.) The columns of Goll are intensely degenerated, the columns of Burdach are less degenerated. The direct cerebellar tracts, the crossed pyramidal and right direct pyramidal tracts are considerably degenerated.

Mallory's stain shows numerous "tourbillons" in the posterior columns. The sclerosis is much more intense in the ventral two thirds of Goll's columns. Some slight indication of the "tourbillons" is found in the crossed pyramidal tracts. The sclerosis is much more dense in the columns of Goll than elsewhere. The vessels of the posterior roots in the cervical and lumbar regions are much congested. The posterior columns stained by the Bielschowsky method show a fairly large number of axis cylinders; these are short and are cut longitudinally in transverse sections because of the distortion of the fibers in the "tourbillons." These axis cylinders are more numerous in more anterior portions of Goll's columns than they are in the extreme posterior part.

The right and left paracentral lobules stain well by the Weigert method. The nerve cells do not appear so large as normal, and possibly are not quite so numerous. No large Betz cells are found, although a few cells of the Betz type but smaller than these are present.

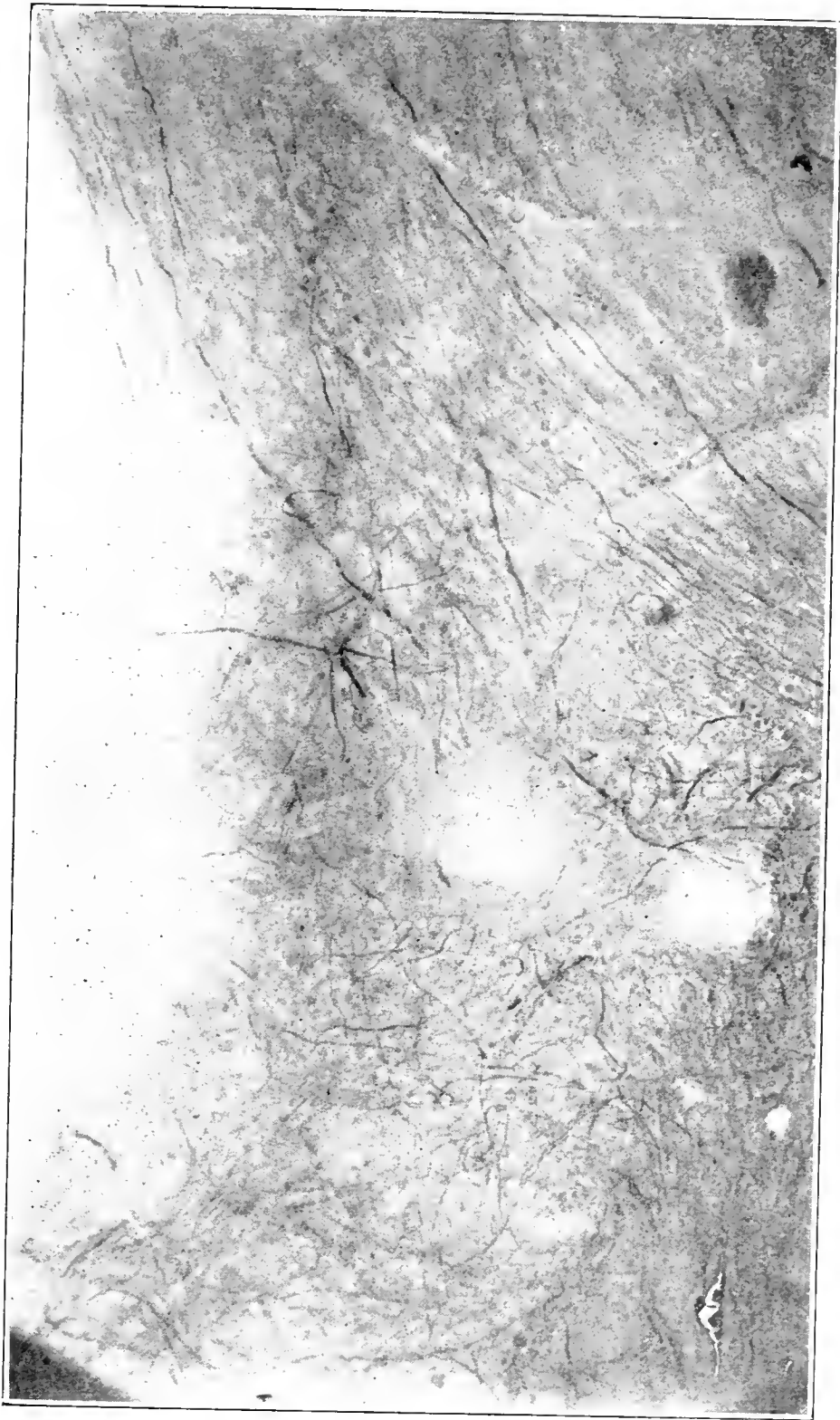


FIG. 5. Longitudinal section from a case of Friedreich's ataxia (Case I), taken from the low thoracic region and stained by the Bielschowsky method. Whereas in the posterior part of the columns the axis cylinders are seen arranged longitudinally, here in the anterior part of the columns of Goll the axis cylinders run in all directions. Compare with Fig. 6.

The cells of Purkinje in the cerebellum by thionin are numerous and well stained, and in sections made by the Weigert medullary method they appear normal. The nucleus dentatus contains comparatively few cells, and most of those present are shriveled. The superior cerebellar peduncles are smaller than usual.



FIG. 6. Longitudinal section from a case of Friedreich's ataxia (Case I), taken from the low thoracic region and stained by the Bielschowsky method. Many naked axis cylinders arranged longitudinally are seen, whereas by the Weigert method this region appeared almost entirely degenerated. The axis cylinders are within the columns of Goll.

Sections were examined from the left radial, left ulnar, left median, posterior interosseous, external and internal plantar, and anterior tibial nerves; they are greatly degenerated, and the fibers preserved are not unusually small.

Sections were taken from the following muscles: extensor communis digitorum, tibialis anticus, extensor proprius hallucis, from the plantar region, including the interossei, abductor minimi digiti, thenar and hypothenar eminences, extensor primi internodii pollicis, and extensor secundi internodii pollicis.

The muscles show considerable alteration. Many of the muscle fibers are atrophied, the sarcolemma nuclei are increased in number, the transverse striation in some is indistinct, as is also the longitudinal striation to some extent, and some fibers have a



FIG. 7. Section from the anterior tibial nerve showing great degeneration.

hyaloid appearance. The nerve fibers found within the muscles show degeneration. There is no vacuolation of the muscle fibers. The extensor communis digitorum does not appear so much altered as the other muscles. The fibers of the extensor proprius hallucis are larger than those of other muscles. Muscle from the hypothenar and thenar eminences stained by the Marchi method shows many fibers with small black dots in lines within the muscle fibers, indicating recent degeneration. This is present only in moderate intensity in the tibialis anticus muscle.

Lumbar and Sacral Ganglia.—The cells of the capsules are much proliferated, many of the nerve cells are much shrunken, and many are highly pigmented. With thionin many of the nerve cells are pale and have peripheral nuclei. Medullated fibers are

not very numerous within the ganglia, but are equally numerous at the two ends of a ganglion. A radicular nerve from a lower ganglion shows slight cellular infiltration.

Gasserian Ganglion.—Some proliferation of the cells of the capsules is found but not so much as in the lower spinal ganglia. There is a distinct increase of round cells between the nerve cells. The nerve cells are not much altered except that some are much pigmented. The sensory roots of both fifth nerves are much degenerated. Some bundles are deeply stained by the Weigert method, and these probably belong to the motor portion. The spinal roots in the medulla oblongata, however, show little alteration.

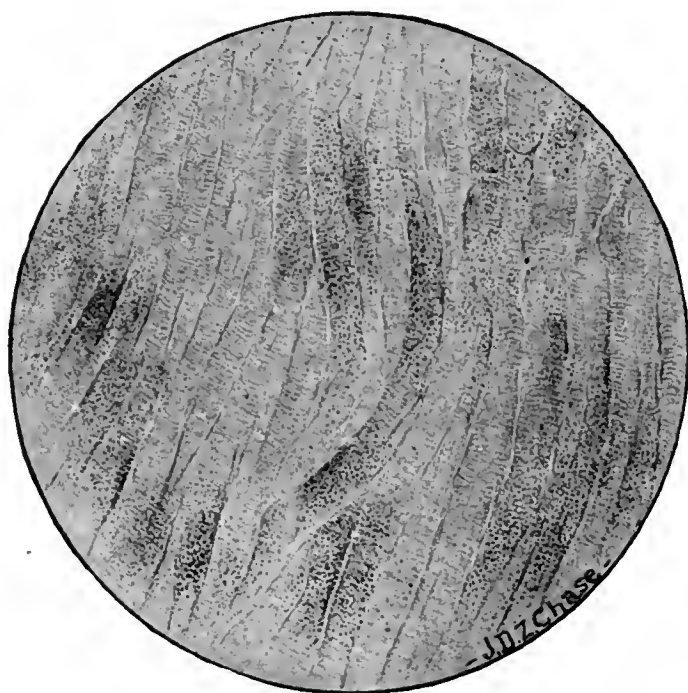


FIG. 8. Section from the extensor communis digitorum muscle, stained by the Marchi method. Numerous small black dots, caused by fat within the muscle fibers, are seen.

The medulla oblongata shows no degeneration of the anterior pyramids. The cells of the lower olive are normal in number but are much smaller. The optic nerves and chiasm are not degenerated.

I am indebted for the photographs illustrating this case to Dr. Allan J. Smith.

The following clinical case of Friedreich's ataxia has been in my service frequently at the Philadelphia General Hospital, and has been studied also by my colleagues on the neurological staff. It is included because of the pronounced atrophy of the limbs.

W. Soudan, 41 years old, began to walk when three years old, and walked with a cane until he was 15 years old. He staggered much and was clumsy in lifting his feet, and often fell when walking. In 1895 he became unable to walk, and for some time before his admission he found it more difficult to walk at night.

In 1890 he had severe attacks of pain in the stomach, with nausea and vomiting, suggesting gastric crises.

Speech always has been slow. Intelligence is good.



FIG. 9. Pronounced atrophy of the hands in a case of Friedreich's ataxia. (Case II.)

His condition since 1898 has varied very little, except that he has grown weaker in his lower limbs. In 1898 he had marked atrophy of the interossei muscles and of the thenar and hypothenar eminences, and marked symmetrical atrophy of the calves. His station was very ataxic.

In May, 1905, Babinski's sign was absent on both sides. Friedreich's toe was not present.

His condition at present (March 2, 1910) as observed by me is as follows: He has marked nystagmus in looking either to the

right or left, but none in looking straight forward. There is no tremor of the head, and no paralysis of the muscles of the face. The tongue is normal. Touch, pain, heat and cold sensations are normal in the face. Speech is slow and somewhat monotonous. The pupils are equal, although the left may be a trifle larger. The irides respond promptly to light and in convergence.



FIG. 10. Pronounced atrophy of the feet and legs below the knees, with foot-drop and hard edema of the feet in a case of Friedreich's ataxia. (Case II.)

Touch, pain, heat and cold sensations are normal in the upper limbs, even in the hands. The hands and lower part of the forearms are greatly wasted, and the fingers except the thumbs are partially flexed. From the middle of the forearms upward the upper limbs are well developed. Considerable fibrillary tremor is seen in the triceps muscles and in the right second interosseous

space. The biceps and triceps tendon jerks are absent on each side. He has good motor power at the shoulder and elbow, and considerable power at the wrist. The grasp is surprisingly strong in view of the atrophy of the hands. Finger to nose test shows marked ataxia. He recognizes objects in his hands very imperfectly. Sense of position is good in each hand.

The power in the lower limbs is very good at hips and knees. The lower limbs below the knees are greatly wasted. The feet drop at the ankles, and the muscles of the feet are very flaccid. The feet are cyanotic and show a considerable degree of hard edema, the flesh not pitting on pressure. He has much ataxia in trying to touch an object with either foot.

Patellar and Achilles reflexes are lost on either side. Pain, heat and cold sensations are normal in the lower limbs, even in the feet. There is moderate impairment of tactile sensation and of the sense of position in the feet.

When supported by the arms he is able to stand and to bear a part of his weight on his lower limbs, but his steps are very incoördinate. He has not the Friedreich's toe.

The first case is especially worthy of comment in the atrophy of the legs below the knees (and atrophy in peripheral parts of all the limbs was very pronounced in the second case), in the pronounced degeneration of many nerves examined, and in the condition of the upper arms, and to a less extent of the thighs, resembling pseudohypertrophy, and associated with great weakness.

Atrophy of the limbs occurs in Friedreich's ataxia but is not common; its existence is denied by some writers, thus Otto Maas² in 1904 reported two clinical cases in brother and sister, in which he excluded Friedreich's ataxia because of spasms and pronounced atrophy which in his own words "diesem Symptomen-complex fremd sind."

Bäumlin,³ however, in 1901 reported a case of Friedreich's ataxia without necropsy with atrophy of the interosseous muscles of the hands and pseudohypertrophy of the shoulders, upper arms, and forearms, with fibrillary twitching. He remarked that atrophy limited to muscle groups is rare in Friedreich's ataxia; he refers to cases reported by Dejerine, Hodge, Whyte, Bramwell, Griffith, and Rook, and he quotes a number of authors who have found degeneration of the peripheral nerves in Friedreich's

² Maas, *Berliner klinische Wochenschrift*, no. 31, Aug. 1, 1904, p. 832.

³ Bäumlin, *Deutsche Zeitschrift für Nervenheilkunde*, vol. 20, 1901, p. 265.

ataxia, but states that necropsies have not been obtained in cases with atrophy.

Kollarits,⁴ as late as 1906, made the statement that muscular atrophy does not belong to Friedreich's ataxia. He seems to have changed his opinion to some extent later, as in 1908 he wrote that the muscular atrophy of this disease is caused by changes in the cells of the anterior horns or peripheral nerves. Disease of the peripheral nerves has only occasionally been found, and this can not be always the cause of the muscular atrophy. There are cases, he says, like Schultze's, his own and many others in which muscular atrophy occurs in Friedreich's ataxia, although the cells of the anterior horns, the anterior roots and the peripheral nerves are healthy. As the muscular atrophy is not the result of disease of the peripheral neurones we must seek another cause. It occurs only in advanced cases, and it might be attributed to inactivity, but that is not a probable cause. He attributes the atrophy to muscular dystrophy; this opinion is strengthened by his case and others as the dystrophy was observed histologically.

One can now hardly dispute that atrophy occurs in Friedreich's ataxia, but it seems to be only a late sign. It is important to determine the cause of this atrophy. As mentioned above, Kollarits is unwilling to attribute it always to disease of the nerves, anterior roots, or cells of the anterior horns. When Dejerine⁵ wrote in 1890 on the disease under consideration he could state that no definite information was obtainable on the condition of the peripheral nerves. Rüttimeyer is the only author to whom he refers in this matter, and he found only a few fibers degenerated in the nerves. Dejerine believed that degeneration of nerves does not occur in Friedreich's ataxia as it does in tabes.

Oppenheim in the fifth edition of his text-book states that atrophy of the posterior roots and nerves is not a constant nor important finding.

Jules Vincent⁶ in his thesis published in 1900 states that usually the cells of the anterior horns are found to be normal, but Friedreich, and Rüttimeyer, in certain cases found them

⁴ Kollarits, *Deutsche Zeitschrift für Nervenheilkunde*, vol. 30, 1906, p. 295.

⁵ Dejerine, *Comptes rendus de la Société de Biologie*, 1890, p. 105.

⁶ Jules Vincent, thesis, Paris, 1900.

atrophied, and Vincent believed these changes may explain the muscular atrophy. Bäumlín⁷ in 1901 stated that twenty cases of Friedreich's ataxia with necropsy were on record, and that in six of these changes in the anterior horns were found, and he gives reference to these.

Bing⁸ states that in necropsies in cases of Friedreich's ataxia neuritic changes were found by Friedreich, Rüttimeyer, Guizzetti, Mirto, Bonnus, Mackay; and that these changes were chiefly in the sciatic nerve. He attributed the atrophy below the knees in his case with necropsy to neuritis, although if the lesions had been studied earlier in the case he thinks they might have resembled the findings of muscular dystrophy.

Dejerine and Thomas⁹ in 1907 found the nerves degenerated, and the smaller fibers in the nerves were in excess. The cells of the anterior horns were normal.

Mott's¹⁰ case is one of the most thoroughly studied in regard to Friedreich's ataxia in the literature. He found the anterior roots and the cells of the anterior horns at all levels normal, but he found a great outfall of coarse fibers with integrity of fine fibers in the peripheral nerves, especially in the nerves of the lower limbs, and wasting of muscles although striation was fairly normal. Mott adds that only in a few cases of this disease have the peripheral nerves been examined, in some of these the nerves were reported to be normal, in others degenerated, "Recent chromolytic changes" in the cells of the anterior horns which Mott found he regards as unimportant.

Müller¹¹ in a case he reported found no decrease in the number of cells in the anterior horns, although he states that these cells were few in some of the cervical sections.

The question of atrophy is closely associated with that of muscular dystrophy occurring in Friedreich's ataxia. Bäumlín in 1901 reported the finding of pseudohypertrophy of the shoulders, upper arms and forearms, with fibrillary twitching. He regarded pseudohypertrophy as very rare in Friedreich's disease and even questioned whether it can be said to have oc-

⁷ Bäumlín, *Deutsche Zeitschrift für Nervenheilkunde*, vol. 20, 1901, p. 265.

⁸ Bing, *Deutsches Archiv für klin. Med.*, vol. 83, 1905, p. 199.

⁹ Dejerine and Thomas, *Revue Neurologique*, vol. 15, 1907, p. 41.

¹⁰ Mott, *Archives of Neurology from the Pathological Laboratory of the London County Asylums*, vol. 3, 1907, p. 180.

¹¹ Wladislaus Müller, *Wiener klinische Rundschau*, 1908.

curred with certainty. The cases of Mastin, in which the pseudohypertrophy was chiefly in the calf muscles, Bäumlín¹² regarded as transitional forms.

Bing¹³ writing in 1906 remarked that pseudohypertrophy of the shoulder girdle, of the upper arms and forearms, seen in his case, had not previously been observed in any case. He does not appear to have given proper credit to Bäumlín. Bing regarded the condition in his case as muscular dystrophy, and believes it was not the mere occurrence of muscular dystrophy with Friedreich's disease in the same person, but that a close connection existed between the two diseases. He depended largely on the histological examination for the diagnosis of muscular dystrophy. There is close connection ("an unbroken chain" he calls it) between Friedreich's disease, hereditary cerebellar ataxia, family cerebral diplegia, family spastic paralysis, family lateral sclerosis, etc.

In this statement he follows closely in the footsteps of Jendrassik.

Jendrassik¹⁴ believes the hereditary diseases are related diseases and have only an apparently external similarity with certain exogenous disease types, as tabes, spastic paralysis, Huntington's chorea, etc. There is no close relationship between the exogenous and endogenous, *i. e.*, hereditary diseases. The number and variety of the types of hereditary diseases are great, and they pass one into the other, and make every classification impossible. Jendrassik tries to do with the hereditary diseases what Erb has done with the types of muscular dystrophy, to unite them all under one head. He reports in this paper two cases of atypical Friedreich's disease with weakness of the shoulder muscles like that of dystrophy.

In his second contribution¹⁵ to hereditary diseases, he says that hereditary nervous diseases have an identical course within the same family, but vary greatly in different families, so that one may describe almost as many types as there are families affected. He has included all under the head of the family

¹² Bräumlín, *Deutsche Zeitschrift für Nervenheilkunde*, vol. 20, 1901, p. 265.

¹³ Bing, *Deutsches Archiv für klinische Medizin*, vol. 83, 1905, p. 199.

¹⁴ Jendrassik, *Deutsche Zeitschrift für Nervenheilkunde*, vol. 22, 1902, p. 444.

¹⁵ Jendrassik, *Deutsches Archiv für klinische Medizin*, vol. 61, 1898, p. 187.

degeneration, and speaks of the various forms as the dystrophic type, spastic paraplegic type, Friedreich's type, etc.

Kollarits refers to the occurrence of muscular dystrophy with hereditary spastic paralysis, quoting Seeligmüller, Hoffmann, O. Maas, Jendrassik, and himself, and asserts that all these observations show that Jendrassik is correct in believing that muscular dystrophy, hereditary spastic spinal paralysis, Friedreich's disease, and Marie's cerebellar hereditary ataxia, are not independent diseases, but are inseparable and pass into one another as forms of the family heredo-degeneration.

Raymond and Ross,¹⁶ in reporting a clinical case of family disease intermediate to spastic paralysis and hereditary cerebellar ataxia, refer to the cases of Strümpell, Newmark, Brissaud, Bischoff, in which a combined sclerosis was found. They also assert that all gradations may exist between the different types of family disease of the nervous system. The coexistence of myopathy with Friedreich's disease (Ghilarducci) gives a further application to this view.

Pathology affords some support to these radical views and is deserving of more attention in this respect than has been paid to it; thus degeneration of the posterior columns in combination with degeneration of the pyramidal tracts has been found in family spastic paralysis (Newmark).¹⁷ The former is slight in the lumbar region, but becomes more pronounced in the thoracic region, and occupies the columns of Goll, and becomes intense in the cervical region. The cells of the columns of Clarke are not numerous. These cells have been found affected in many cases of combined system disease not of family form. The degeneration of the posterior columns differs from that of Friedreich's ataxia chiefly in being slight in the lumbar region. It would seem to be the result of death of the more terminal portions of the fibers in the columns of Goll, and the difference between Friedreich's ataxia and family spastic paralysis, so far as pathology is concerned, seems to be one largely of degree. The cells of Clarke's columns are greatly affected in the former, slightly in the latter. In the former the degeneration of the posterior columns predominates over that of the lateral columns; in the latter the degeneration of the pyramidal tracts predomi-

¹⁶ Raymond and Ross, *L'Encéphale*, March 10, 1909, p. 209.

¹⁷ Newmark, *Deutsche Zeitschrift für Nervenheilkunde*, Vol. XXVII, 1904, p. 1, and Vol. XXXI, 1906, p. 224.

nates over that of the posterior columns, at least in the lumbar region. In each family group the tendency to degeneration is greater in the same tracts, but in the family spastic paralysis the degeneration does not appear to extend into the lumbar region to any severity. Newmark's two cases with necropsy show however that in family spastic paralysis the degeneration of the columns of Goll above the lumbar region may equal or exceed that of the pyramidal tracts.

It is noteworthy that in both the cases of Friedreich's ataxia I report in this paper, more especially in the second, the atrophy was confined to the peripheral parts of the limbs and resembled closely that occurring in neural muscular atrophy. In my second case the atrophy had not seriously implicated the central portions of the limbs even after many years. This restriction to the peripheral parts of the limbs is one of the most diagnostic features of the neural muscular atrophy.

Gierlich¹⁸ regards neural muscular atrophy as a special form, but he acknowledges that transitional cases to muscular dystrophy, tabes and neuritis are to be recognized. We may take Gierlich's case as a typical example of the neural atrophy, and compare it with Friedreich's ataxia. A boy, apparently normal at birth, showed paralysis of the dorsal flexors of the feet at the beginning of the second year, with shortening of the Achilles tendons and formation of talipes equino varus. The hand muscles began to waste at the fourth year of life. The patellar reflexes were lost. Sensation and coördination were normal.

Microscopically was found degeneration of the posterior columns which occupied almost the entire area except the dorso-ventral fields, but higher was almost confined to the columns of Goll, invading the columns of Burdach slightly. Degeneration of less intensity was found in the postero-lateral portion of the lateral columns, *i. e.*, in the crossed pyramidal tracts, the direct cerebellar tracts, and the tracts of Gowers. Loss of fibers and atrophy of cells were observed in Clarke's columns. Lissauer's zone was intact. Some of the cells of the anterior horns were degenerated. All these changes were almost identical to those observed by me in my case of Friedreich's ataxia, except that in the latter the cells of the columns of Clarke had entirely disappeared, and the posterior roots were greatly degenerated,

¹⁸ Gierlich, *Archiv für Psychiatrie*, vol. 45, no. 2, 1909, p. 447.

whereas in Gierlich's case of neural atrophy the latter were intact. The alterations of the muscles and nerves resembled that observed in my case. Degeneration of posterior roots has however been found in neural muscular atrophy (Marinesco); in other cases the posterior roots were intact (Siemerling, Sainton, Dejerine and Armand-Delille).

Gierlich also has been interested in the resemblance of the pathological findings of neural muscular atrophy to those of Friedreich's ataxia, and yet the characteristic symptoms of the latter, viz.: ataxia, nystagmus, speech disturbance, etc., are absent in neural atrophy. He does not fully discuss the subject.

It seems probable to me that one must seek the cause of the characteristic symptoms of Friedreich's ataxia in some additional changes to those mentioned. The alteration of the posterior roots and of the cells of Clarke's columns in great intensity is not common in neural atrophy and may help to explain the symptoms of Friedreich's ataxia. The ataxia, nystagmus and speech disturbances of the latter may find their explanation in the alteration of the cells in the cerebellar nuclei, especially in those of the nucleus dentatus, and possibly of those in the lower olive; changes which probably have often been overlooked in Friedreich's ataxia.

As opposed to these views in which the attempt is made to do away with all sharp distinctions between the family forms of disease are the statements of Steinert and Versé.¹⁹ These authors say that it is not so well known that lipomatosis and pseudohypertrophy occur in neuritis. The nature of the muscular atrophy in Friedreich's disease can not be considered settled, but transitional cases of Friedreich's disease to primary myopathic progressive dystrophy, which destroy the sharp lines dividing the two diseases, do not exist. Only in one case from the Budapest clinic does the atrophy seem to be similar to the type of myopathic progressive dystrophy (Jendrássik) and this case may be a combination of the two diseases. They regard the attempt to do away with sharp distinctions between the hereditary diseases as unwarranted. They regard Bing's statement as rash, viz., that the pseudohypertrophy of the shoulder muscles and upper limbs was muscular dystrophy as shown by the microscopical examination. They state that pseudohypertrophy was

¹⁹ Steinert and Versé, *Mitteilungen aus den Grenzgebieten der Medizin und Chirurgie*, vol. 21, no. 1, p. 105.

found by Bing where the nerves were not diseased, but they have no explanation to give for this.

Jules Vincelet stated in his thesis (1900) that most authors have found the deep sensation normal, and that degeneration of the posterior columns was present in all cases. He found only eighteen cases with necropsy, but he did not include Griffith's cases. Mott recently (1907) has stated that all cases have shown degeneration of the posterior columns. Dejerine in 1890 mentioned that the degeneration of the posterior columns in Friedreich's ataxia does not always correspond to the degeneration of the posterior roots, especially is this true when Lissauer's zone is intact. In tabes the degeneration of the posterior roots is always proportional to that of the posterior columns. Because of the better condition of the roots in Friedreich's ataxia, and of the good condition of the nerves, the sensation is intact, according to his view. Since 1890 we have had reason to doubt the integrity of the peripheral nerves in advanced Friedreich's ataxia, and must seek another explanation for the preserved sensation. Dejerine in this paper made the assertion that intense degeneration of the posterior columns may exist a long time without sensory changes.

In the case reported by Dejerine and Thomas²⁰ in 1907 the ataxia was extreme, the sense of position was intact. They found the fibers in the posterior roots of fine caliber, but they speak of the finding as marked atrophy of the fibers, instead of stating, as Mott does, that the large fibers had degenerated and the small fibers were preserved in the posterior roots. In the posterior columns, except in the cornu-commissural zones, and the postero-external root zones, the axis cylinders had almost completely disappeared. Lissauer's zone contained many axis cylinders. In the cervical region the columns of Goll contained few axis cylinders by Cajal's method. They say their case shows that Goll's columns are not necessary for sensation. They found not only the central segment of the posterior roots, but also the portion peripheral to the ganglion atrophied. They believe the atrophy of the posterior roots (they never speak of small fibers being simply small fibers which have resisted degeneration, as Mott considers them) is a retrograde atrophy from the degeneration of the posterior columns.

In this case the sense of position was intact and Goll's

²⁰ Dejerine and Thomas, *Revue Neurologique*, vol. 15, 1907, p. 41.

columns were completely degenerated. Where then do fibers of sense of position and touch ascend?

In Kollarits's²¹ case touch, temperature and pain sensations were intact notwithstanding the posterior columns were intensely degenerated. This is not a new observation but one that has not received sufficient attention. Friedreich said it is certain that the posterior columns are not the only or most important tracts for conduction of sensation. This subject has been studied also by E. Müller. Müller believed that naked axis cylinders in the degenerated areas conveyed the sensations, but he had no findings justifying this opinion. Kollarits says it is certain that the view concerning conduction of tactile sensation in the posterior columns is contradicted by many observations.

Mott believes the small fibers of the posterior roots subserve cutaneous sensory and viscerovascular functions, and in Friedreich's ataxia there is little or no affection of cutaneous sensibility and no visceral disturbances. The fine fibers are lost in tabes, therefore the alteration of sensation in tabes occurs.

My second case shows that cutaneous sensation is not always absolutely intact, as tactile sensation in the peripheral portions of the lower limbs was affected, but sensory changes usually are slight in Friedreich's ataxia. This may be explained by the discovery in my first case of many axis cylinders by Bielschowsky's method in the posterior columns. The only other case of this disease in which a selective axis cylinder stain was employed was that reported by Dejerine and Thomas. In the cervical region in their case few axis cylinders were found in the columns of Goll by Cajal's method. In my case they were numerous by the Bielschowsky method in the middle and more anterior portions of the columns of Goll in the lower thoracic and cervical regions, and in the "tourbillons" they took part in these peculiar formations and were cut more or less longitudinally for a short distance in transverse sections. It is probable that the posterior columns are capable of more function in Friedreich's ataxia than the Weigert's medullary stain gives reason to believe.

Ataxia is a common sign of Friedreich's ataxia, and gives a part of the name. The presence of so much incoördination with preserved sensation is remarkable, but we have every reason to

²¹ Kollarits, *Deutsche Zeitschrift für Nervenheilkunde*, vol. 34, 1908, p. 410.

believe that fibers necessary for coördination are distinct from those on which sensation depends. J. S. Risien Russell,²² in his recent Lettsomian lectures, describes the anatomy of the tracts of coördination in the following words:

"In the dorsal sensory nerve roots are fibers which convey afferent impressions from the muscles, joints and deeper structures, as opposed to the skin, some of which pass to Clarke's column of cells, from which is derived the dorsal or direct cerebellar tract; while others cross in the anterior commissure, and pass upwards in the ventro-lateral region of the cord, constituting the ventral or crossed cerebellar tract of Gowers. Both of these tracts pass to the cerebellum to terminate in the cortex of the organ, the former, as we have already seen, by way of the inferior peduncle, while the latter courses along the superior peduncle to end in the cortex of the middle lobe. From the cortex fibers pass to the nuclei, and from the dentate nucleus fibers are derived which leave the organ by way of the superior peduncles, to reach the red nucleus and optic thalamus of the opposite side, and through the thalamus connect the cerebellum with the cerebral cortex."

While therefore there seem to be no fibers that pass directly from the direct cerebellar and Gowers's tracts to the cerebellar nuclei, these nuclei receive fibers from the cerebellar cortex in which these tracts end, and therefore may be atrophied secondarily to degeneration of these tracts.

In the recent experimental work of MacNalty and Horsley²³ lesions of the cervical spino-cerebellar tracts caused ataxia and clumsiness of movements, most noticeable in the upper limb. These fibers arise at least in part in Clarke's column.

The ataxia of tabes probably is largely the result of degeneration of fibers going to Clarke's columns, even though the cells of these columns do not disappear. The same conditions exist in Friedreich's ataxia with absence of the cells of Clarke's columns, as these cells seem to have disappeared in almost every case. Vincelet says Clarke alone found these cells normal.

Mott found degenerative atrophy of the dentate nucleus as I have also. He states that there was not a healthy normal cell in this nucleus; some of these cells were represented by a little

²² J. S. Risien Russell, *British Medical Journal*, Feb. 19, 1910, p. 425.

²³ MacNalty and Horsley, *Brain*, vol. 32, 1909, p. 237.

pigmented protoplasm. The Purkinje cells were atrophied in places. There is thus a pronounced disturbance in the tracts of coördination in the cord (the direct cerebellar and tracts of Gowers), as well as of the chief organ of coördination, the cerebellum. The cerebellum, according to Oppenheim,²⁴ has been found normal in many recent cases; in others (Raymond, Mott), hypogenesis (unusual smallness) or abnormality of its structure, especially of its nerve cells, has been found. Müller, in a very comprehensive article on this disease, states that in by far the majority of cases the cerebellum was entirely normal, but one can not but question the thoroughness of the examination of some of these cases. The number of cases, he states in 1908, in which hypoplasia of the cord and cerebellum, as well as of their connections, with or without structural changes occur, is very small. If we collect the cases in which there were symptoms of disease of the cord and cerebellum dependent on congenital hypoplasia with or without degeneration, they number something over ten.

Almost all authors, according to Müller, have either neglected the examination of the cerebrum or have made no mention of its condition. Nonne found diminution of certain cerebral gyri in the brain of a man, but no microscopical changes; the brain he studied weighed 1,030 grammes. In another case, the brain of a man weighed 1,020 grammes, some gyri were small, but no microscopical changes were found in the brain. Cramer found slight widening of the fissures and slight atrophy of the gyri of the frontal lobe. Straüssler found moderate diminution of the gyri, especially in the frontal lobe, and widening of the fissures and slight atrophy of the cerebral cortex with peculiar changes in the cells, unimportant in the cerebrum but important in the cord, cerebellum and medulla oblongata. These are not the only cases in literature, but Müller says these were collected from nearly 200 cases in the literature, and they show how little importance has been placed on the examination of the brain in Friedreich's ataxia. He refers to one or two other cases in which the cerebral lesions seem to be of little importance.

Müller²⁵ found many changes in the cerebral cortical nerve cells, the layers were not clearly marked, many cells were imperfectly formed, and the Betz cells were absent in the precentral

²⁴ Oppenheim, *Lehrbuch*, p. 224.

²⁵ Waladislaus Müller, *Weiner klinische Rundschau*, 1908.

gyrus (he does not mention whether they were found in the paracentral lobule). Müller found changes in the entire central nervous system.

Mott describes naked eye wastings of the upper part of the cerebral convolutions, atrophy of Betz cells, thinning of the ascending frontal and ascending parietal cortex, diffuse sclerosis of the internal capsule and of the pyramidal tract in the crus cerebri, and marked sclerosis of the pyramidal systems, crossed and direct, in the medulla oblongata and spinal cord. Mott's patient was feeble-minded and suicidal. He found some medium-sized Betz cells but almost complete absence of giant Betz cells.

My patient was also rather feeble mentally, but many cases of Friedreich's ataxia present no mental deterioration. The upper part of the ascending frontal and ascending parietal convolutions were narrow and no large Betz cells were found in the paracentral lobules.

From findings like these it is difficult to accept the theory that the degeneration of the lateral columns is not in the crossed pyramidal tracts. Oppenheim²⁶ regards the changes described by Mott in the cells of the motor cortex as probably secondary, but there seems to be no good reason for so regarding them.

The degeneration of the direct pyramidal tract is another argument in favor of the implication of the pyramidal tract fibers. Oppenheim says Schultze once found the direct pyramidal tract degenerated. In Mott's case degeneration of this tract was not very intense, was more on one side, and was most distinct in the upper thoracic region. It extended downward to the eighth or ninth thoracic segment. The degeneration of the right pyramidal tract in my case was pronounced.

The lateral columns are not always diseased. Wladislaus Müller states that they are diseased in more than half the cases. Mott says a considerable number of cases show no degeneration or slight degeneration of the crossed pyramidal tracts. In the case of Friedreich's ataxia described by Lhermitte and Artom²⁷ the posterior columns of the cord were degenerated without degeneration of the lateral columns, except a marginal degeneration.

Mott found the lumbro-sacral ganglia much smaller than normal. The ganglia contained a number of myelinated fibers,

²⁶ Oppenheim, Lehrbuch.

and he detected atrophy or disappearance of many cells of these ganglia. I also have found degenerative changes in these ganglia.

Lhermitte and Artom²⁷ are the only authors I have found who refer to the radicular nerves. These nerves presented atrophy without the transverse neuritis described by Nageotte, and the condition was similar in my case.

²⁷ Lhermitte and Artom, *Bulletins et Mémoires de la Société Anatomique de Paris*, 1907, p. 556.

Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

March 1, 1910.

The President, DR. J. RAMSAY HUNT, in the Chair

A CASE FOR DIAGNOSIS: PROBABLY MULTIPLE SCLEROSIS

By Dr. S. P. Goodhart

The patient was a man, 34 years old, whose personal and family history was negative. He was a moderate user of alcohol and tobacco and denied specific infection. No etiological factor for his present illness could be elicited.

His present illness apparently dated back about eight years, and began with ringing in the right ear and progressive loss of hearing. The tinnitus and deafness varied in intensity. His acute symptoms began in the spring of 1908 with staggering gait. The ringing in the ear became more intense, and the ataxic gait more pronounced. He had several seizures of vertigo and became unduly emotional, with a tendency to uncontrollable weeping. Since the fall of 1908 there had been a progressive spasticity of the right leg, and some weakness and incoördination in the movements of the left arm and right leg, together with some paresthesia in those extremities. There were no objective sensory changes. The staggering gait had gradually disappeared, while the auditory symptoms remained variable. There was slight but manifest nystagmus, both outer extremes of position. The knee jerks were much exaggerated, the right more so than the left. Babinski and ankle clonus were present. The abdominal reflexes were absent. Gait spastic. There was no cranial nerve involvement. The patient had recently complained of occipital pain, radiating to the front. There was no optic neuritis or general symptoms pointing to an intra-cranial lesion.

Dr. Goodhart said the case was probably one of multiple sclerosis. It was originally diagnosed by two neurologists as a fibroma of the acoustic nerve.

Dr. Joseph Fraenkel said that when he saw this patient two or three years ago, he made the diagnosis of fibroma of the acoustic nerve, and he was still inclined to that view. The absence of any etiological factor of multiple sclerosis, the absence of intention tremor, and the speech, which had more of the bulbar character, all militated against multiple sclerosis, nor did he see why the absence of the abdominal reflexes should be regarded as strengthening that diagnosis. On the other hand, there was no optic neuritis nor general symptoms pointing to a brain neoplasm, but these might develop later. He recalled one case of brain tumor where nineteen years elapsed before the development of such symptoms.

Dr. William B. Noyes said that in the differential diagnosis between

tumors of the acoustic nerve or cerebellum, the test of alternating hot or cold solutions in the ear is of value. This test was now being investigated by the otologists. Where the vestibular portion of the acoustic nerve is affected, the nystagmus and ataxia show a definite reaction. Dr. Noyes asked if this test had been tried in the case under discussion and whether any members of the Neurological Society had any practical experience with it. It was in exactly such cases as the one under discussion that it was of value. Many symptoms usually attributed to the cerebellum, are caused by lesions of the ear.

Dr. E. W. Taylor, of Boston, said that in the case shown by Dr. Goodhart the symptoms were such that it would be going a little far to suppose that the primary trouble was a tumor of the acoustic nerve. The absence of optic neuritis and headache, and the lack of involvement of the seventh nerve argued against that supposition. On the other hand, the nystagmus and staggering gait and the exaggerated knee jerks seemed to point to a multiple sclerosis. He could recall cases of multiple sclerosis extending over a period of many years in which during various stages the symptoms were atypical and obscure and were attributed to other lesions.

The president, Dr. J. Ramsay Hunt, said he was inclined to agree with Dr. Goodhart and Dr. Taylor, that the case was an unusual manifestation of multiple sclerosis, rather than a tumor of the acoustic nerve. With the latter, there are usually symptoms indicating other cranial nerves; there is almost invariably some involvement of the facial or trigeminal, when the tumor has reached sufficient size to cause compression of the brain stem. He thought an isolated auditory symptom should be regarded with great scepticism, especially in the absence of optic neuritis and general cerebral symptoms.

Dr. Fraenkel said we should not lose sight of the fact that in a certain stage of neoplasm of the acoustic nerve, optic neuritis and involvement of the adjacent facial nerve might be absent. He recalled one case of acoustic fibroma which was regarded as a multiple sclerosis in which there was no facial involvement until about a week prior to operation. In making the diagnosis in these cases, we should always bear in mind the stage of the disease.

Dr. Goodhart, in closing the discussion, said he thought that in this stage of the present case, if it were one of acoustic neoplasm, we would expect to find evidences of involvement of other cranial nerves and some of the general symptoms of brain tumor.

OPERATION FOR CEREBELLAR CYST

By Dr. S. P. Goodhart

The patient was a man, 22 years old, whose personal and family history was absolutely negative. His present illness dated back to March, 1909, when he began to complain of sudden noises in the right ear, like escaping steam, soon followed by gradual loss of hearing which ended in complete deafness of the right ear. Six weeks after the onset of his auditory symptoms the patient had paroxysmal attacks of vertigo, vomiting of a projectile character and occipital headache. At first these seizures came on only upon arising and lasted ten or fifteen minutes; subsequently they recurred several times a day. The noise in the ear was intense. Later diplopia developed.

Upon examination, the deafness of the right ear proved to be absolute. There was corneal areflexia of the right eye; otherwise, the trigeminal distribution was unaffected. There was paresis of the right external rectus, with resulting diplopia; there was a slight paresis of the right facial in all three of its branches, with slight quantitative electrical changes; marked choked discs (5 and 6 diop.); slight paresis of the right arm and leg, with a slight degree of ataxia and hypotonia in the same areas. All of these symptoms were very slight indeed, and could only be demonstrated by careful examination. There was also slow, coarse rotary nystagmus to the right; rapid and fine to the left.

A diagnosis of cerebellar cyst or neoplasm of the right lobe was made, and the patient was operated on at Mt. Sinai Hospital by Dr. Charles A. Elsberg on May 19, 1909. A suboccipital craniotomy was done. The dura was opened by a T-shaped incision, allowing the outer half of the right cerebellum to prolapse. A cyst was found in the right lobe, occupying almost three quarters of the lobe. A blood-tinged fluid was evacuated, and as the cyst wall was too thin for removal, it was touched with iodine.

The patient made a rapid recovery, all his symptoms disappearing with the exception of slight nystagmus and slight weakness of the external rectus of the right eye. No etiological factor to account for the cyst could be elicited.

Dr. Adolf Meyer said he had seen a number of cases of cerebellar cyst, and he had found it difficult to account for the fact that this region of the brain should so frequently be the seat of such a lesion. It was quite probable that some of these cysts were the residues of tumors that had undergone degeneration, and in a few instances this had been demonstrated. In one case which he examined serially, the sections showed no trace of any residual tumor tissue. In some cysts the lining was gliomatous, in other endothelial. The contents of the cysts were sometimes serous, and at times the fluid coagulated and became jelly-like when exposed to the air. Whether the nature of the contents indicated any difference in their origin he did not know.

Dr. Fraenkel said that in a case of cerebellar cyst which was operated on by Dr. Elsberg at Mt. Sinai Hospital about two years ago the symptoms were such that for many years the case was regarded as one of multiple sclerosis, and the diagnosis of intra-cerebellar growth was not made until evidences of brain compression developed. Upon operation, an old hemorrhagic cyst was found. No etiological factor could be elicited.

THE INTERPRETATION OF CERTAIN CEREBRAL SYMPTOMS WITH REFERENCE TO v. MONAKOW'S THEORY OF DIASCHISIS

By Dr. E. W. Taylor of Boston

For our present purpose, Dr. Taylor said, v. Monakow's theory might be summarized as follows: The symptoms of defect following a cerebral lesion were not to be regarded alone as the consequence of the anatomical destruction of nerve elements or of accompanying pathological processes in definite cortical areas, but also as results of concomitant dynamic influences which took origin from such cortical and subcortical gray are as often widely separated from the original lesion as were connected with the

lesion through fiber tracts, and which in elective fashion spread in the neighborhood of the destroyed neurones. This dynamic action was in principle temporary, but led to a widespread diaschisis as its immediate consequence. In general, we had previously endeavored to localize developed functions in the cortex before having determined what in principle could be localized and what not. v. Monakow's conception was that only elementary components of a function might be localized in the cortex and only those that served spatial orientation together with the most closely associated motor response of a given stimulus. All other conditions proceeding from the sense areas, as, for example, the finer differentiation of stimuli, memory components, feelings, above all, psychic factors, in which the time element played the main rôle—all of these could not be localized sharply in the cortex. If this statement was in general true, it followed that between the anatomical lesion and the clinical picture of disease a certain "something" lay that we did not yet understand; certain varying, coördinating, regulating factors; or, to speak more precisely, certain dynamic modes of action having only an indirect connection with the anatomical lesion, which were temporary, but under certain circumstances might also remain stable.

As to the value of the theory of diaschisis from a practical standpoint, Dr. Taylor said it offered a basis of explanation for otherwise unexplained effects of disease or injury of the central nervous system. It added significance to anatomical study; it prepared the way for an understanding of certain conditions which now appeared fortuitous; it conceivably made possible a relatively accurate prediction of the results of lesions; it clarified our thinking; it recognized not only the subtle inter-actions of the parts of the nervous system, but offered a method of studying those interactions on the basis of a fixed principle; it demanded investigation of the localization theory on the basis of an analysis of function as well as structure, and their relationship through dynamic elements. These all seemed to be eminently practical aims.

As to how widely the theory was applicable, nothing could definitely be said until many cases had been investigated by its means, with accurate anatomical findings. The influence of concomitant pathological conditions admittedly obscured the action of diaschisis in manifold ways. Predisposition, vascular changes, age, with its accompanying lowered resistance to degeneration, were all elements complicating the situation. The effect in a given lesion in one person might be very different from its effect in another, due to such causes. This factor materially interfered with useful generalizations. Again, the theory did not apply in equal measure to lesions of gradual onset. The extraordinary adaptability of the brain to destructive lesions of slow development was always a confusing factor in diagnosis. Other elements than diaschisis must presumably be called to our aid in the interpretation of such conditions. Finally, it might be said with no likelihood of contradiction that it was altogether premature to apply the diaschisis theory to the higher psychical attributes until the simpler functions had been studiously investigated. Even there, however, we might ultimately see a possible fruitful field in the application of the theory.

Dr. Adolf Meyer said it was somewhat embarrassing to follow such a clear presentation with an *ex-tempore* statement of the impressions gleaned from listening to the paper, and especially so upon a topic concerning which he had personally gained a rather different impression from

the one that Dr. Taylor had brought out. He did not see how v. Monakow could have found a better exponent of his views than Dr. Taylor had proved to be, both from the point of clarity and allegiance. Somehow, Dr. Meyer said, he had never been able to share the optimism concerning this term diaschisis, which seemed to him to be an expression possessing much more negative than positive value. It offered a term for something which had to be studied from case to case as a problem before it could be of value, and it might even be regarded as a survival of our former exaggerated desire for localization. It essentially implied that the focal lesion had a "power" to reach out to some other centers. If we regarded the nervous system as a series of superimposed hierarchies of function, as the speaker said he had attempted to do in teaching neurology, as when he spoke of the segmental and suprasegmental functions of the nervous system, we had to realize the fact that we were by no means in possession of complete material at the present time for a structural reconstruction of the functions with which we were dealing. We knew that we could excise the pyramidal tract in the monkey without producing any paralysis whatever. That might be called negative diaschisis. We knew that we had large basal masses in the brain. How were they connected? How did they perform their functions? We had there a whole mass of structure which had not yet been accounted for and which still remained as a gap in our knowledge. Whether it would be wise to call all real but transitory disorders of functional integration diaschisis he was not quite sure, especially if we wished to adopt the idea of v. Monakow that a central lesion reached out and influenced other centers as in the pure motor aphasia of Ladame. His own idea, Dr. Meyer said, was something like this: We had certain segmental mechanisms which were capable of certain fundamental functions by themselves. In addition to these, we had the cerebral integrations and those supplied by the mid-brain and thalamus, and we knew that the elimination of certain of these superimposed helps did not necessarily disturb the whole balance. These superimposed mechanisms help and balance each other, and to a certain extent help to replace each other, as is exemplified by Bockel's work on the motor regulations of the nervous system. This theory of balance and disorders of balance, it seemed to him, was more plausible than it would be to emphasize some mysterious negative force, as v. Monakow had done, and attribute to certain brain lesions the power to influence parts as widely separated as the motor speech zone of the articulation-segment of the medulla as by a dynamic action which he did not attempt to explain. If we accepted this theory, the term diaschisis might easily become a rather dangerous resting point.

Dr. Fraenkel said that about six or seven years ago, when he was asked to write an article on cerebellar disease for the "Reference Handbook of the Medical Sciences," he was struck by the fact that there was no definite foundation for localization. He could not find a single function which was definitely and permanently either present or absent when something happened to the cerebellum. It depended on the kind of animal, the time and the observer.

Discussing Dr. Taylor's paper, Dr. Fraenkel said that to begin with, we knew very little about the relation of structure to function. We knew very little about the evolution of function or how it developed. We knew very little about the obscurity of individuality. It was very difficult to find a sufficiently large group of cases with almost identical

lesions anywhere in the central nervous system that presented almost identical or even analogous symptoms. For this reason, it seemed to him inordinately difficult to advance any satisfactory theory which would explain destruction or compensation of function. Personally, he believed that the physiological association of the entire symptom mechanism rested largely on the individuality and habits and even the age of the patient. As an illustration of this we found that disease of the hypophysis would produce different trophic symptoms in the child and in the adult.

In concluding his remarks, the speaker said he would join Dr. Meyer in his belief that a general conception, like diaschisis, had so little support that it would tend to confuse rather than to help us in the deeper study of the functions of the nerve centers.

Dr. Smith Ely Jelliffe said that while he could add little of practical value to the discussion of Dr. Taylor's most complete and interesting paper, still he felt that the formulation of a doctrine like this was an advance along lines of greater clarity and precision. Within the past decade complete serial sections of the brain had become necessary for the study of anatomical connections and for the elucidation of physiological functions, and as these complete serial sections were being studied more and more in detail, we were arriving at a closer appreciation of the inter-dependent character of the functional relations of different parts of the cerebral cortex, the subbasal ganglia and the spinal cord. v. Monakow's theory of diaschisis was nothing more or less than an attempt at a more exact and precise method of dealing with old problems. Janet had the same thing in mind when he advanced his theory of dissociation as did Wernicke and his pupils in his sejunction hypothesis.

It seemed to him, Dr. Jelliffe said, that in strictly limiting the application of the diaschisis theory to the interdependence of different parts of the cortex—more particularly in connection with the study of apraxia and of aphasia—it was being kept within too narrow limits, and that as our knowledge of the brain became more definite and extended, the hypothesis could be applied to larger and wider functions. An appreciation of diaschisis action in the differentiation of frontal and cerebellar localizations is a question in point, and Kleist, in applying Wernicke's sejunction hypothesis to the study of psychomotor activities in catatonia, was affording fruitful material for the application of v. Monakow's ideas in the psychiatric field.

Dr. I. Abrahamson said he wished to refer briefly to a case seen in the service of Dr. Sachs at Mt. Sinai Hospital, which had a bearing upon this problem, and also upon the question of aphasia.

The patient, in falling, was found to have lost his speech, he had slight right hemiparesis and a depressed fracture in his right frontal region. The depressed bone was raised, but with no improvement in his symptoms. He then entered Mt. Sinai Hospital where the diagnosis of a contrecoup hemorrhage involving Broca's convolution was made; the patient presenting a cortical motor aphasia. The operation revealed the existence of such a hemorrhage, and it was removed and the patient's speech began to improve rapidly; sometime later when there had been quite marked return of speech, the patient suffered an attack of Jacksonian epilepsy involving the right side, after which for hours he lost his recently acquired speech, though otherwise he was fully normal. Thereafter he made an uneventful recovery.

While various reasons for the return of the speech of aphasics have

been given, *i. e.*, the vicarious action of the other hemisphere, or of the basal ganglia, or the local restitution, the loss of speech after the Jacksonian attack would point rather to the last as the most probable.

Monakow's diaschisis might explain the phenomenon upon the first two assumptions, but would be entirely unnecessary if we accept the last and more likely view.

Dr. Taylor in closing the discussion, doubted if there was any great necessity of warning the profession against this theory, as Drs. Meyer and Fraenkel seemed to believe. The speaker said he doubted whether it would ever be widely accepted, judging by the reception it had received here and elsewhere. Comparatively little attention had been given to it by writers on cerebral localization. There was, on the whole, nothing advanced by either Dr. Meyer or Dr. Frankel that was incompatible with *v. Monakow's* idea. His attitude was an analytical one; he neither denied nor affirmed the nerve center theory, but was attempting to throw light on the significance of that vague term. No one would deny that there was a tremendous gap between structure and function, and here again *v. Monakow's* attempt was to analyze what the term function implies. The distinction between residual and temporary symptoms was of distinct value.

Dr. Taylor said that the conception appealed to him, that it seemed to clarify the situation rather than to obscure it, since it took hold of the individual problem and worked it down to a point of exactitude which had not been given it by more general statements. *v. Monakow's* idea was not to revolutionize, but simply to explain, and he had succeeded better, so far as the speaker's knowledge of the subject went, than many others who had attempted the same problem. He would therefore be inclined to agree with Dr. Jelliffe rather than with the other speakers. *v. Monakow's* theory was surely better than none at all, and if anomalous conditions could be rendered understandable by its use, he saw no danger in its application. Of course, it should not be carried too far, as the author himself had done in some instances when he had attempted to explain the persistence of diaschisis, for example, on the ground of individual predisposition.

NEW YORK NEUROLOGICAL SOCIETY

April 5, 1910

The President, Dr. J. RAMSAY HUNT, in the Chair.

TWO CASES OF BRAIN TUMOR

By Smith Ely Jelliffe, M.D.

CASE I: The patient was a married woman, fifty-one years old, who for the past seven or eight or nine years had suffered from indefinite and irregular attacks of headache which in the beginning resembled migraine. For the past three years her headaches had become a little more persistent and were associated at times with a certain amount of vertigo. The grade of vertigo was difficult to approximate, and was best described by an incident told by the patient herself. About two and a half years ago, while on her way to the bank one morning to deposit some money, she was

accosted by a policeman on the street, who asked her whether it was not rather early in the day to "have such a load on"; to which she replied, "What do you think of that? Wouldn't that jar you?"

About six months later, while suffering from one of these attacks of dizziness, she fell down eight steps, striking on her forehead. She was not unconscious; there was no bleeding, and apparently no severe symptoms followed this fall, but almost immediately afterwards—whether as a coincidence or not—she lost the sense of smell and became blind in the right eye. She also had occasional attacks of vomiting, and on two or three occasions there was involuntary defecation.

About this time Dr. Jelliffe saw the patient in consultation, and sent her to the Neurological Institute for observation. The neurological examination was practically negative. There was complete blindness of the right eye, and beginning choked disk on the opposite side. There was also a certain amount of mental impairment; the patient was somewhat silly and showed a marked tendency to joke. For example, when asked how much seven times eight was, she replied, "I know that, because it is the amount of my milk bill." Her joking was of a rather superficial character, showing the characters that had been described as *Witzelsucht*.

A diagnosis of right prefrontal tumor was made, and towards the middle line, and pressing upon the r. olfactory tract. She was operated on by Dr. John F. Erdmann about a week ago, who made a frontal flap, and as soon as the dura was opened, a large tumor, four by three by two inches popped out. It weighed $4\frac{5}{8}$ oz. The patient died forty hours after the operation from hemorrhage. The pathological character of the tumor had not yet been determined.

CASE II: The second case reported by Dr. Jelliffe was that of a married woman, thirty years old, who was perfectly well up to the latter part of June, 1909. She came to New York from her home in the country, and spent the day shopping. The weather was very warm, and she became rather tired. The train arrived at her station, which was about half a mile from her home, in the midst of a severe thunder storm, of which she had always had a peculiar dread. She ran all the way home from the station, dragging her seven-year-old child with her. Upon her arrival home she rested for a few minutes, and then spent the rest of the day in assisting her servant in putting up some preserves.

When she awoke the next morning she complained of pain and a tingling sensation in the right side of the face; she saw double and had a squint. On the following day she saw an oculist, who discovered a complete paralysis of the right external rectus; nothing else. She was put on potassium iodide in large doses, which made her very sick. This treatment was continued for several weeks, giving rise to nausea and vomiting. In the meantime, she grew progressively worse, and it was then thought that she had a hysterical paralysis, and she was sent to an institution where she was given psychical treatment. She grew still worse, and on December 1, 1909, about five months after the onset of her initial symptoms, Dr. Jelliffe was asked to see her. At this time there was complete external and internal ophthalmoplegia, with loss of knee jerks. There was some headache, no vomiting nor other symptoms. Diagnosis, tumor of the brain at the base and inoperable.

The patient was taken to the Neurological Institute for observation, and remained there up to the time of her death, about a week ago, nine months after the onset of the external rectus palsy. Subsequent to the

ophthalmoplegia, she developed a chemosis in both conjunctivæ. About two months prior to her death she developed a complete hemiplegia followed by paraplegia. Optic hallucinations and loss of orientation were frequently observed during the four months of stay in the institute.

The autopsy showed an enormous sarcoma at the base of the brain, which had totally destroyed the ethmoid plate, projected itself into both antrums and globes, and had invaded the nasal fossæ and the nose.

Dr. Ernest Sachs asked Dr. Jelliffe whether in his first case there was any evidence of a unilateral tremor of the hand, which had been described by Stewart as being almost characteristic of frontal tumor. The tremor was on the same side as the tumor. Dr. Sachs said he had observed this symptom once or twice, and it was distinctly different from the ataxic tremor associated with cerebellar disease.

Dr. Jelliffe, in reply to Dr. E. Sachs, said there had been no tremor whatever of the hand.

LESION OF THE ROLANDIC AREA ACCOMPANIED BY CUTANEOUS SENSORY SYMPTOMS

By William M. Leszynsky, M.D.

A man, twenty-four years of age, was struck on the head by a brick four months ago, receiving a compound, comminuted fracture of the left parietal bone. This was at once followed by paralysis of all the muscles below the right knee. He gradually recovered from the effects of the injury, and at present there was a depression in the left side of the skull an inch and a half wide by two inches long, involving the parietal bone up to the median line. The opening was directly over the superior portion of the Rolandic area, as demonstrated by measurement. Paralysis of the flexors and extensors of the toes, exaggerated knee-jerk, ankle clonus and the Babinski plantar response were present. There was an area of complete anesthesia extending from the toes to about two and a half inches below the patella anteriorly, and to about three inches below the popliteal space posteriorly, with a circular band of dissociated sensory disturbance above this. The other extremities were normal.

Dr. Leszynsky concluded that the existing conditions were due to laceration and hemorrhage involving the superior portion of the precentral and post-central gyri.

Dr. Joseph Fraenkel asked whether there were any trophic disturbances. In a case which he saw about nine years ago at Bellevue Hospital, identical symptoms were present. The lesion, which was in the same place as this one, was the result of a bullet wound, and in that case there were dystrophic lesions on the toes, resembling Morvan's disease.

RESULT OF NERVE SUTURE IN A CASE OF BRACHIAL BIRTH PALSY SEVEN YEARS AFTER OPERATION

By Alfred S. Taylor, M.D.

The case was one of typical brachial birth palsy. At the time of the operation, which was done on June 17, 1903, the patient was a girl of ten years, with palsy of the right arm, which had been noticed immediately

after birth, the delivery having been instrumental. When Dr. Taylor first saw her there was slight contracture in all of the paralyzed muscles, producing the characteristic deformity. The operative technique employed by Dr. Taylor in this and similar cases was described by him in detail in an article entitled: "A Study on Brachial Birth Palsy," published in the *American Journal of the Medical Sciences*, October, 1905.

At the present time, about seven years after the operation, the extremity has grown well, and there has been much improvement in the range of motion. She can "do her hair," play the piano, and do most of the things other girls can do.

There is distinct limitation in external rotation of the humerus.

She was ten years old at the time of operation, and this meant that there were contractures in the paralyzed muscles, in the ligaments of the joints, and deformities of the joint ends of the bones, which will never be fully overcome. Nevertheless, there is very great improvement over her condition before operation.

Dr. T. P. Prout, in connection with Dr. Taylor's case, exhibited a drawing of the nerve structures, which clearly showed a rupture of the peri-neural sheath.

CEREBELLAR ATTITUDE OF THE HEAD IN A DOG

By Ernest Sachs, M.D.

A fox terrier under certain conditions exhibited the typical cerebellar attitude with the right ear nearer the shoulder, and the face turned up and to the opposite side. Dr. Sachs expected later to perform an autopsy on the animal, in the hope of finding a lesion which might throw some light on the significance of the cerebellar attitude.

Two explanations, he said, had been advanced for the so-called cerebellar attitude in cases of cerebellar neoplasm. One was that the patient held his head in that peculiar way to relieve tension on the muscles on that side on account of the pain that was otherwise present. The other idea on the subject, which was accepted more particularly abroad, was that it was due to a lesion of the superior peduncle. This, Dr. Sachs said, was the view that he was inclined to accept. The theory that it was done to relieve tension and pain was scarcely tenable, as there were cases of cerebellar neoplasm that had no pain. On the other hand, after section of the superior peduncle animals always assumed the cerebellar attitude, and by cutting the eighth nerve on the opposite side, the head resumed its normal position.

The dog shown by Dr. Sachs, aside from the cerebellar attitude, had no symptoms of cerebellar trouble. He was active and his appetite was good. His sensation, as far as it could be tested, was normal. The eye-grounds were rather pale, with some diminution in the size of the vessels, but there was no choked disk.

INTRASPINAL NEURECTOMY FOR INTRACTABLE TABETIC GASTRALGIA

By T. P. Prout, M.D., and Alfred S. Taylor, M.D.

The patient was a man, fifty years old, who was first seen by Dr. Prout in October, 1909. He had suffered from locomotor ataxia for

seven years, and was a morphine habitue of five years' standing. For the past eighteen months he had taken so much morphine that he had been compelled to give up a responsible position, the morphine having rendered him practically useless. In order to resume his work, he was very anxious to be cured of the morphine habit. He was then taking about six grains of the drug daily. He stated that whenever there was need for the drug, he felt quite a sharp pain in the epigastric region. The man was fairly well nourished; he could walk with little or no difficulty, and stated that he had experienced very little pain in the extremities. The use of morphine had been begun to overcome an uncomfortable feeling in the abdomen.

The gradual withdrawal of the drug was cautiously begun, but as soon as there was any appreciable reduction, the pain in the epigastrium became so severe that the treatment was suspended. A second attempt at reduction was followed by a like result, and the treatment was finally abandoned. The pain was so severe that the patient evidently suffered intensely, the countenance being livid, the skin clammy, the pulse rapid, and the patient himself crying on account of the pain in the epigastrium.

Dr. Prout finally suggested the intraspinal section of the posterior nerve roots as affording the only means of relief from the pain and the cure of the habit. This plan was gladly assented to by the patient, and the intraspinal section of the posterior nerve roots of the seventh, eighth and ninth dorsal segments was done by Dr. Alfred S. Taylor in December, 1909. The result was excellent, in that the pain was relieved absolutely and the patient himself volunteered the statement that the necessity for taking morphine was removed, excepting for the fact that he felt exceedingly nervous when he was deprived of the drug. The daily quantity of morphine was lowered by the patient himself to four or four and a half grains, on which amount he found that he was quite comfortable. He made an uneventful recovery from the operation, and his general health improved. He was now undergoing treatment for the morphine habit with some success, and Dr. Prout expressed the hope that he would ultimately be able to eliminate the drug. The operation of intraspinal neurectomy seemed to him to have been justifiable in this case because of the peculiar circumstances connected with it. It was imperative to do something, and by severing the posterior nerve roots we were carrying out by surgical means what was slowly taking place by pathological changes.

Dr. Alfred S. Taylor said that in performing the operation of intraspinal neurectomy in the case reported by Dr. Prout, the nerve roots of both sides were approached through a unilateral laminectomy, and access was gained to them with comparative ease. The seventh to the tenth dorsal inclusive were divided on both sides. The patient made an excellent recovery; the wound closed primarily and left a good scar. On the morning following the operation, the epigastric pain from which the man had suffered had apparently disappeared. His face had lost its tense look, and he was fairly comfortable in spite of the fact that he had taken no morphine at all. Prior to that he had usually taken two grains about five o'clock in the morning, and a second dose before seven o'clock. After the operation he took three quarters of a grain the first day and on the following day a grain and a half.

Dr. Charles I. Dana said the case reported by Drs. Prout and Taylor was extremely interesting because it opened up a new field for therapeutic

work, but it should be understood that the operation was done for the relief of a psychosis, as well as for the pains of tabes. This man, apparently, suffered from morphine pain more than from tabetic pain. The operation doubtless produced a profound impression and was helpful, as was often the case in morphine psychoses. The speaker said he did not wish to suggest that it was not a cured case, but we could not infer that it was an operation for gastric crises alone in tabes. In other words, the operation had relieved a psychosis as well as the tabes pain.

Dr. Prout said the case was undoubtedly one of tabes. The gastric pain did not strike him as being a characteristic morphine pain, because there were evidences of positive suffering. The pulse was rapid, the skin clammy and the man showed other evidences of real physical pain.

Dr. Dana said he had never seen a case of tabes in which the gastric or other pain was continuous. It was always intermittent in character.

Dr. Taylor, replying to Dr. Dana's suggestion that the pain was a morphine pain, said that this man had suffered from the pain before he began to use morphine, and that it was because of the pain that he became addicted to the habit. He had been free from pain since the operation.

DECUSSATION OF THE PYRAMIDS

By Henry M. Thomas, M.D.

Dr. Thomas, of Baltimore, read an historical paper¹ illustrated by lantern slides copied from original sources, on the development of our knowledge as to the decussation of the pyramids. He pointed out that although the crossed effect of the brain was known from very early times, mentioned by Hippocrates, Aretæus and others, that the anatomical basis upon which it rested was not determined until well into the last century. The explanation given by Aretæus that the crossed effect was due to the decussation of the nerves before they reached the limbs, was commonly accepted even up to the beginning of the nineteenth century.

The clinical fact seems to have been so largely lost sight of in the dark ages that Valsalva and Morgagni, in the early part of the eighteenth century, regarded as practically a new discovery the fact that the lesion in the brain was to be looked for on the side opposite to the paralyzed limbs. This discovery was due to the fact that autopsies had become much more frequent.

The credit of having discovered the decussation of the pyramidal fibers is often assigned to Domenico Mistichelli, but Dr. Thomas showed by quotations and plates from his work on apoplexy, "*Trattato Dell Apoplessia*," published in 1709, that he had no clear idea of this fact, but that the discovery was due to a French military surgeon, Francois Bourfour du Petit, who in a little book entitled "*Trois Lettres*," etc., published in Namur in 1710, gave a clear description of it. Petit's observations were based on clinical, experimental and anatomical work. His drawing, although crude, demonstrated that he had discovered the decussation of the pyramids.

The discovery of Petit, confirmed by a few, misunderstood by many, and practically forgotten, was rediscovered by Gall, the phrenologist, in

¹ To be published in the Bulletin of the Johns Hopkins Hospital.

the early part of the nineteenth century, and confirmed by Sir Charles Bell (1834 and 1835), who added a fanciful decussation of the lateral columns which he regarded as sensory tracts.

After this time the rich physiological and anatomical investigations of the nervous system ushered in the modern period.

Histological investigation demonstrated the decussation of fibers passing to the nuclei of the motor cranial nerves (Schroeder van der Kolk) above that of the pyramids, and of fibers in the spinal cord below. The studies of secondary degeneration by Türck (1852 and 1853), Bouchard, Charcot, and of the developing spinal cord by Flechsig (1876), were essential to our modern conception of the question.

Dr. Dana said he had been much interested in listening to Dr. Thomas's illuminating presentation of this subject. He himself had a sort of obsession as regards medical history. He believes it very important and helpful that we should know something of the history of the past in medicine, and of the men the fruits of whose labors we enjoyed.

Some time ago, Dr. Dana said, he took a special interest in tracing the history of the men whose names were linked with the anatomy of different parts of the nervous system, men whom he called epinomic anatomists, and in connection with the subject he had some stereopticon slides made which were of interest from a historical standpoint as bearing upon the question of the development of our knowledge of the nervous system.

Dr. Dana then showed upon the screen some of the earlier conceptions of the pons Varolii, the columns of Goll, the islands of Reil, the radiations of Gratiolet and other parts of the central nervous system as pictured by those whose names were afterwards associated with them.

Dr. B. Sachs presented to the society the first copy of the report of the Poliomyelitis Committee of 1907, and upon his suggestion it was moved and seconded that the committee be discharged. Carried.

PHILADELPHIA NEUROLOGICAL SOCIETY

February 25, 1910

The President, Dr. H. DONALDSON, in the Chair.

A CASE OF SYRINGOMYELIA

By E. H. ERNEY, M.D.

Patient, a man about 35 years of age, mechanic, with a negative family and personal history, began to have fissures in the palmar surface of the fingers of both hands which resisted healing for two years. He had an attack of typhoid fever, following which sloughing appeared in the left shoulder. This was operated upon and an old fracture discovered of which the patient was unaware. He had had, however, a dull ache in this shoulder for a year previous to the operation and for which he had been treated for rheumatism. Since then he has been operated upon a number of times, the wound refusing to heal and being considered of tuberculous origin. It was notable that the surgical dressing never caused pain. Subsequent to the operations he burned his hands on several occasions and was unaware that he had done so.,

He was referred to the nervous department of the Medico-Chirurgical Hospital where a diagnosis was made of syringomyelia, the patient having the typical dissociation of sensation. This area extended from the neck to the level of the first lumbar vertebra in back and in front on a line extending with the umbilicus, involving the abdomen, chest and upper limbs above. He had fibrillary twitchings in the upper extremities and irregular wasting of the spinal type in these parts. A trophic condition in the fingers of both hands was manifested. The x-ray by Dr. Pfahler showed an atrophy of the fingers in both upper extremities, this being sharply circumscribed, especially in the phalanges, and differing from the areas of necrosis found in tuberculosis.

The case is interesting from the fact that it was undiagnosed for a number of years. The area of dissociated sensation was sharply defined and involved the whole of the upper limbs, lower part of the neck, chest and abdomen above the umbilicus, this being unusual because in most cases the sensory disturbance has more or less of a segmental distribution and does not take in continuously such a large surface.

Dr. T. H. Weisenburg said that Dr. Erney's case was interesting from many standpoints. First of all from the question of diagnosis. He had been in the hands of surgeons for some years who had repeatedly operated upon his shoulder, one of the earliest symptoms having been a fracture of the shoulder joint which had refused to heal, they considering it a case of tuberculosis. A careful clinical examination by Dr. Erney also demonstrated that there was a loss of bone sensation as well as for electrical stimuli as tested by static sparks over the same areas in which there was loss of temperature and pain sensation. Besides a careful x-ray examination by Dr. Pfahler had demonstrated a rarefaction of all the bones within these parts. The study of bone and electrical sensation has not been carried on to as great extent as it should be and it is possible that, as illustrated in this case, alterations in the nutrition of the bone tissue are among the earliest symptoms in syringomyelia and we may have in the development of this symptom an early sign of the disease. In one other case at the present time in the clinic of the Medico-Chirurgical Hospital there were present all the symptoms of a progressive spinal atrophy. Further examination by Dr. Erney demonstrated disturbances in all forms of sensation but especially in temperature and pain. Vibratory sensation, however, demonstrated a loss of bone sensibility.

TUMOR OF THE THIRD VENTRICLE: THE QUESTION OF CENTRAL PARALYSIS OF THE MOTOR FIFTH NERVE

By T. H. Weisenburg, M.D.

The patient was a man who, about six months previously, wandered away for three days and lost himself, not knowing where he was or giving a reason therefor. Since that time he had been acting queerly. Under iodid he improved for some months and was apparently well when he began to complain of headache, some morning nausea, irritability and of noises in the left ear which only came on at times and were likened to a band of music. Examination then demonstrated a failure of convergence on the right with an ectopia pupillæ which came on only at times, a tendency to stagger to one side, the gait being of the cerebellar type, loss of the knee jerks with preservation of the Achilles reflexes and some ataxia

in the upper and lower limbs with no choked disc. The day after the first examination he had an attack of noises in his left ear and then developed a sudden paralysis in the left arm and lower part of the left face. The weakness in the arm disappeared within a day, but that in the lower part of the face still persists. Further examination also demonstrated that when the jaw was opened it deviated to the right, although the masseter and temporals acted normally. Sensation was intact everywhere. These latter symptoms have persisted, and besides at times he has a tinnitus in his left ear but he does not have a disturbance of hearing.

The diagnosis of tumor in the third ventricle is based upon the weakness in the lower part of the left face, a history of weakness in the left arm, the tinnitus in his left ear which is thought to be an irritative symptom of the right central eighth fibers, failure of convergence on the right with ectopia pupillae, the weakness in the pterygoid which is offered as a central type of fifth nerve palsy, the ataxia, and occasional cerebellar gait, it being thought that a tumor in the third ventricle would cause pressure on either side and also on the continuation of the superior cerebellar peduncles and partially on the third nucleus.

There have been a few cases reported in which there was a temporary weakness of the masseter in acute central lesions as in hemiplegia, but there are no recorded cases of weakness in the external pterygoid alone. Dr. Weisenburg has seen in two instances a temporary weakness in the masseter in a fresh hemiplegia. This is the second case in which he has noticed a weakness in the pterygoid alone and believes that just as there is a central form of facial palsy, there is a central form of fifth nerve palsy in which the pterygoid may be involved alone. Of the principal muscles of mastication, that is, the temporal, masseter and external pterygoid, the pterygoid is preponderantly a unilaterally acting muscle, and according to the law of bilateral innervation it is possible that this can be involved alone just as in the face the lower part is involved because it has unilateral action.

Dr. W. W. Hawke thought that with the pupillary symptoms, history of being a hard-working man, his age, his present mental and physical state, that general paralysis of the insane should certainly be considered and the likelihood of it accounting for all of the patient's symptoms.

Dr. Alfred Gordon thought the suggestion offered by Dr. Hawke might be a possibility. The dragging, slow speech and the epileptiform seizure in which the arm became paralyzed, the loss of the knee jerks and the disturbance in convergence, the disturbance in the mental condition—these are all symptoms of general paralysis. However, Dr. Weisenburg's diagnosis is possible, although very rarely made.

Dr. Alfred Reginald Allen said that he saw the patient with Dr. Weisenburg a few weeks ago. Apropos of the man's speech, it did not strike him as being in any way indicative of general paralysis of the insane, but rather due to an atonic or semiparalytic condition of the muscles of the soft palate. Dr. Allen asked Dr. Weisenburg whether they had not made some examination of the condition of the patient's soft palate.

Dr. Weisenburg replied that they had found the soft palate affected on one side.

Dr. Allen thought that that was the chief cause that produced the queer phonation.

Dr. Gordon said there seemed to him a real disturbance of speech in addition to the impaired intonation of the voice.

The pupils reacted at times. Sometimes they were perfectly normal and there was absolutely nothing to be found. Dr. Weisenburg had the pupils examined a number of times.

Dr. Weisenburg in closing said that at no time did he consider the diagnosis of tabes or general paresis. So far as tabes is concerned the only reason that such a condition might be thought of would be because of the absence of the knee jerks and the ataxia. He thought the ataxia was distinctly a cerebellar phenomenon, the man having a cerebellar gait. So far as the loss of the knee jerks is concerned Dr. Weisenburg did not think that was unusual in lesions of the cerebellum or of its peduncles. On the other hand, if tabes were present there should be loss or diminution of the Achilles jerks, some disturbance of bladder functions, pains of some kind, girdle sense and disturbance of the pupillary reflexes which the patient did not have.

In so far as paresis is concerned he was glad that this question had been brought up by Dr. Hawke, for the physician who had sent this patient to Dr. Weisenburg thought of a similar condition. Dr. Hawke evidently based such a possibility upon the mental symptoms and the supposed difficulty in speech and loss of knee jerks. Dr. Weisenburg had already accounted for the loss of knee jerks but did not consider the speech altered, inasmuch as the man always has had a peculiar and similar enunciation, according to his wife. So far as the mental symptoms are concerned, these were difficult to account for, but, on the other hand, who has not seen occasional mental symptoms occur in brain tumor? In most of the cases of tumor of the third ventricle which have been reported mental symptoms have played a very prominent rôle, and Dr. Weisenburg was of the opinion, that in the present case, these were largely dependent upon irritation of the central eighth fibres, inasmuch as the mental symptoms occurred only at times and always when there were accompanying noises in the left ear. However, in paresis the mental symptoms should be more or less constant, which they have not been, for as a matter of fact the man was better than when he first came under observation. Besides he should have same pupillary irregularities which he had not. Again it would be difficult in paresis to account for the cerebellar gait, weakness in the pterygoid and the occasional ectopia pupillæ. He of course had seen partial hemiplegia in paresis. The weakness in the argument was that there had not been a Wassermann reaction. Dr. Weisenburg thought after all that whether or not there are mental symptoms the diagnostic points to be considered should always be those of focal origin which pointed here to a lesion of the third ventricle. He presented in a previous meeting of the neurological society the brain of a man in whom both a tumor in the third ventricle and paresis were considered. At necropsy there was found an intense dilatation of all the ventricles but especially the third, while microscopic examination demonstrated the usual changes of paresis, but in this man the mental symptoms were typical of the disease.

AN UNUSUAL CASE OF TUMOR IN THE CEREBELLO-PONTILE
ANGLE WHICH FOR MANY YEARS GAVE THE SYMPTOMS
OF A TIC DOULOUREUX AND THE SYMPTOMS OF IRRITATION
OF THE NINTH AND TWELFTH NERVES

By T. H. Weisenburg, M.D.

The patient, a man of 35, first had pain in the upper teeth which in a short time spread to the distribution of the right fifth nerve and gave the typical symptoms of a tic douloureux. For this he first had all the right teeth removed, then had many superficial operations over the inferior orbital nerve, then an attempt was made to remove the Gasserian ganglion, and finally two thirds of it were removed and the posterior sensory and motor roots cut. After the operation sensation was lost over the usual fifth nerve distribution and also for taste both anteriorly and posteriorly over the right side of the tongue. Two days after this operation he complained of pain in the lower jaw and throat and a burning sensation in the tongue, and from then until his death, two years afterward, he constantly complained of these pains which at times were sharp and shooting in character and started in the back of the right side of the tongue extending into the right side of the throat and into the ear. Besides he had paresthesias over these parts, describing them as a burning sensation or of hot water and occasionally like the crawling of insects. He also developed a trophic condition of the right eye which was finally removed. For the persistence of these pains the upper cervical and lingual nerves were removed but with no result. Towards the last year of his illness he had spasms in the right side of his tongue, it being projected to the right and having a rolling motion. There was no palsy in the pharynx, larynx or throat and the whole right oral cavity and throat were extremely tender. Hearing was not disturbed. He also had twitchings in the distribution of the face.

At autopsy a tumor was found in the right cerebello-pontile angle pressing upon the fifth nerve and also causing pressure on the sixth, seventh, eighth and over the anterior part of the pons. It was so situated that it stretched the ninth, tenth and twelfth nerves and was a fibrosarcoma. The ophthalmic division of the fifth nerve and part of the ganglion were found intact.

There are many important points in the case, the chief being that the persistence of the pains in the throat, ear and tongue was the result of irritation of the ninth nerve, inasmuch as the fifth roots were cut and sensation was lost over the fifth nerve distribution. This case teaches that the distributions of the fifth and ninth cranial nerves intermingle and that if the pain persists in the tongue, ear, throat and apparently the lower face after the fifth nerve is cut it is due to irritation of the ninth nerve. The lack of recognition of this fact was the chief cause for the wrong diagnosis. Also there was complete absence of the so-called general symptoms of brain tumor. This is the first case to be reported of irritation of the ninth nerve.

During the last year there were constant involuntary spasms of the right side of the tongue, it being deviated to the right cheek and teeth and having a rolling motion. This is the first case of this kind on record.

Twitching of the seventh nerve, the result of pressure, is interesting but has been previously recorded.

One of the most interesting facts of the case was that, although there was considerable pressure upon the motor fibers in the pons, there never were any symptoms of weakness in the limbs of the opposite side and examination by the Marchi and Weigert methods demonstrated no degeneration.

Dr. Weisenburg did not think that the presence of the tumor had anything to do with the ganglion operations, in as much as the autopsy demonstrated that the pains in the fifth nerve distribution were due to pressure on the sensory root by the tumor.

REMARKABLE PREVALENCE OF MIGRAINE IN A LARGE FAMILY, ASSOCIATED WITH UNUSUAL SENSORY DISTURBANCE IN THREE OF THE NUMBER

By George E. Price, M.D.

A report of ten cases of migraine in one family—seven out of eight members of one generation being thus affected.

Beside the more common premonitory symptoms of vertigo, amblyopia, hemianopia, aphasia, and numbness of arm, tongue and lips, three of the cases presented numbness and hypesthesia of the entire half of the body including face, arm and leg. This was so severe at times as to interfere with locomotion.

Attention was called to the fact that these sensory changes, being most marked at the distal portion of the extremities, conformed to the type of organic anesthesia and differed from the sharply defined hysterical hemi-anesthesia.

In one of the cases epilepsy was associated with migraine, and in another, twitching of the extremities occurred during the paroxysm.

The stupor, somnolence, delirium and euphoria sometimes seen in migraine were considered as the result of a toxemia.

The author believes there are two clinical types of migraine, one with vascular constriction, the other with vascular dilatation, and suggested that the cessation of the hyperemic form at middle life was due to a lessened vasomotor control of the blood vessels at this period, owing to their hardening and decrease in elasticity.

Dr. Cadwalader said that about two years ago he had had the opportunity of examining a patient of Dr. J. K. Mitchell's who suffered from attacks of migraine very similar to those of which Dr. Price's patient complained. In this case sensory phenomena began in the left hand, extending to the left face, lips and tongue, and later to the lower extremity; this was followed by very severe left-sided headache with visual disturbances, drowsiness and sometimes delirium, lasting two or three days, also weakness with increased tendon reflexes on the left side of the body. On two or three occasions there was said to have been loss of consciousness and twitching of the left hand and face with incomplete motor aphasia, yet the patient was right handed. On account of the character of the attacks Dr. Mitchell and Dr. Mills, who also saw this patient seriously considered the possibility of epilepsy and organic disease, but after repeated examinations this possibility was excluded by them. Since that time the patient has improved considerably, but is not free from attacks. During this winter he has been nearly totally aphasic for some days at the time after an attack, but without signs of paralysis. The family history of that case, as Dr. Cadwalader

recollected it, was that the patient's father, grandfather, one aunt, one uncle and two sisters had all suffered from attacks somewhat similar in character though not so severe. The patient's father had severe attacks beginning in early youth, but while serving in the Confederate Army his attacks rapidly decreased in severity and in number and finally disappeared entirely. At the close of the war he resumed a sedentary life and then the attacks again made their appearance. Dr. Cadwalader thought this a very interesting example of what can so often be accomplished by an absolute change in the methods of living and habits of life which in many instances is the keynote to treatment of such cases.

Dr. W. W. Hawke read a paper with the title: "The Significance of Sense Deception as a Symptom of Insanity."

Dr. George E. Price thought that Dr. Hawke's point that illusions and hallucinations do not necessarily indicate insanity was well taken. He recalled a case at the Jefferson Dispensary in which the man had marked auditory hallucinations, the interesting point about the case being that the man in no way reacted abnormally to these hallucinations. The man was perfectly sane, he had been an alcoholic but had stopped drinking. Still the hallucinations continued, and for at least six months these hallucinations persisted without the man reacting in an abnormal way. While Dr. Hawke may not consider it important from a psychological standpoint to differentiate between illusions and hallucinations, clinically it is often important as, for example, in making a diagnosis between delirium and mania. In delirium hallucinations predominate while in mania they are rare if they occur at all, but illusions are common.

Dr. Alfred Gordon thought that the particularly interesting part of Dr. Hawke's paper was the suggestion in regard to the caution to be taken in making a diagnosis of insanity based exclusively upon hallucinations. There is no question that one must be extremely careful in suggesting to patients and one must try in a roundabout way to bring out the symptoms of insanity such as delusions as well as hallucinations. In regard to the latter, it is easy to be deceived. There is such a thing as hallucinations as obsessions in perfectly sane people. In reference to this he mentioned two interesting cases which had come recently under his observation. A little girl about eleven became an orphan, lost her father and mother and she could not help but see and hear her mother coming every evening about eight o'clock to put her to sleep. The visual image was very clear and she could give Dr. Gordon a correct description of her mother's attitude. She described her mother's actions perfectly, but she realized the impossibility and absurdity of such a vision.

Another case, a middle aged woman, underwent an abdominal operation, after which she had several attacks of mental disorder. In the last one she came under Dr. Gordon's observation. She would see all of a sudden a crowd of people walking toward her. At a certain time she saw diminutive individuals walking towards her. Dr. Gordon talked to her. She realized that the vision was impossible, that there was nobody in the room, still she saw the people. This is a hallucination in the form of an obsession. A person qualified by the term of hallucinatory cannot be always termed insane. It is insufficient to say that such a person has hallucinations. It is essential to determine exactly whether they are hallucinations of obsessive nature or really symptoms accompanying other genuine manifestations of insanity.

Dr. Hawke said in regard to the remarks of Dr. Price that he had

recently discharged an intelligent young fellow, a college graduate, who returned after his discharge, and asked to see the room in which he had been placed while a patient in the hospital. He admitted that while a patient in the hospital he had had many illusions, but did not believe that he had had any hallucinations, and returned for information on this subject, declaring that from the cracks and marks in the wall and ceiling he pictured many illusions. From one crack in particular he had pictured the state of Ohio, and in the middle of the state the Garden of Eden, with Adam and Eve within.

SUPERFICIAL AND DEEP SENSORY DISTURBANCES IN THEIR RELATION TO ASTEREOGNOSIS AND ASYMBOLIA

By Alfred Gordon, M.D.

Sufficient evidence has already accumulated to show that the recognition of form and of nature of objects are two distinct phenomena, and one does not depend upon the other. Also either of these two phenomena does not altogether depend upon the general or special, superficial or deep sensations, as it is usually believed. Gordon brings in support of this view his personal observations which have been carefully studied during a period of several months. The first case is that of a middle aged-man who suffered an apoplectic stroke with loss of consciousness. This was followed by a paralysis of the right arm and loss of speech. The latter lasted forty-eight hours, but the palsy six weeks. At present there is some ataxia in the hand and some awkwardness in movements of the fingers. The sensory disturbances are interesting. The examination for the latter was done with regard to touch, pain, temperature, pressure, localization (naming, looking and spacing procedures) movements and finally for recognition of form and nature of objects. The most modern methods were carefully applied to delicate tests and the results were as follows: The superficial sensations are totally preserved, while the deep sensations are altered. The stereognostic sense is intact, but recognition of the nature of objects (symbolia) is deficient. In the second case, also a middle-aged woman, who presumably was a tabetic, there is a good motor power and no ataxia in the affected hand. Methods of examination were precisely the same as in the first case. The result shows that the superficial sensations are well preserved, the deep sensations are altered. The stereognostic sense was only slightly altered, viz., for objects of larger size, but asymbolia was complete. This is correct only for the thumb and forefinger, but not for the other fingers, for as soon as the patient handled them with all the fingers, she promptly recognized the form and nature. In the third case, a young man, who had an apoplectic seizure affecting the left arm and lower half of the face, there was complete loss of all forms of sensations in the left hand.

Analyzing in detail his three cases and those recently published by Raymond and Egger (*Revue Neurologique*, 1906, p. 371) also by Rose and Egger (*Semaine Médicale*, 1908, p. 517), Gordon reaches this conclusion: the a priori idea, viz., that all individual sensations must be combined in order to form the proper conception of form and nature of objects—does not always conform with clinical experience which shows that stereognosis and symbolia are independent phenomena, that their relation to elementary sensations is meagre, that they consist of complex associative processes of the highest order, processes in which the well-known sensibilities play only a minor rôle.

Periscope

Deutsche Zeitschrift für Nervenheilkunde

(Band 37. Heft 3 and 4. 1909)

11. Myasthenia Gravis Pseudoparalytica with Positive Changes in the Muscles. J. CSIKY.
12. Further Experience in the Value of the Newer Methods for the Differential Diagnosis of Syphilis. NORNE and HOLZMANN.
13. Disease of the Spinal Cord following Trauma. HELLBACH.
14. Contribution to the Symptomatology of Lead Palsy. TELEKY.
15. Diffuse Tumors of the Spinal Leptomeninges. STRASSUER.
16. Paramyoclonus Multiplex with Muscular Atrophy. STADLER.
17. A Psammoma of the Spinal Arachnoid. HERTZ.

11. *Myasthenia Gravis*.—Clinical and pathological report of a case. Reviews the literature. He was able to collect eighteen cases, including his own, in which round cell infiltration was found in the muscles. The author also noted in his case changes in the fibers, together with sclerosis and fat infiltration. As to its true cause many factors are still lacking, but it most probably lies either in the muscle or in the internal secretions which affect muscle function.

12. *Further Studies on the Reactions in Syphilis*.—These writers studied the value of the four reactions, viz., Lymphocytosis, globulin reaction (phase i) and the Wassermann reaction in the blood and cerebrospinal fluid in a large number of cases. Their conclusions are as follows: (1) In tabes and paresis, lymphocytosis and the globulin reaction are present almost without exception. The reactions are parallel and are present in the same degree in imperfect, in incipient as well as in complete cases. (2) In cerebrospinal syphilis both reactions rarely fail, in multiple sclerosis both reactions are present in the smallest proportion of cases and usually are weak. In epilepsy, neurasthenia, pseudo-tabes alcoholica and tumor cerebri, both reactions fail if syphilis is absent. (3) The Wassermann reaction is present with the blood serum of tabetics in about 60 per cent. to 70 per cent. of the cases, while with the spinal fluid it is almost always absent. In dementia paralytica the Wassermann reaction is present in both blood serum and spinal fluid, a good differential point for the two. In hereditary paresis the Wassermann may fail in the spinal fluid. (4) In idiopathic epilepsy without syphilitic history the Wassermann reaction fails in the blood and spinal liquor. (5) Cerebral tumor, unless specific, shows no Wassermann reaction. (6) Lymphocytosis and phase I reactions do not stand in any causal relation with the Wassermann reaction in the spinal fluid.

16. *Paramyoclonus Multiplex*.—Reports two clinical cases in which the unusual feature of muscular atrophy was present. Besides the characteristic muscular contractions, there were no sensory disturbances, no fibrillary tremors, no reaction of degeneration, no disturbance of the reflexes.

The atrophy was progressive, bilateral in each case, and affected muscles lying together and not in any special groups.

Case I. Atrophy of the muscles, hand and forearm began six years after the onset of the contractions. Contractions were noted in the muscles of the thigh, especially quadriceps, muscles of the shoulder girdle and arm.

Case II. Six months after onset of contractions the patient showed a severe grade of atrophy, beginning in the region of the entire right arm from the shoulder to the hand. Later the left side became affected. It is difficult to say in these two cases whether the two symptoms developed independently, or whether they are the result of the same condition. The still obscure cause should be sought for in a primary disease of the muscle.

17. *Psammoma*.—The unusual feature of the case is the manner in which the tumor surrounded the cord, compressing and softening but not infiltrating it. A total extirpation was in consequence impossible. Most cases of psammoma are sharply defined and are easily shelled out.

S. LEOPOLD (Philadelphia).

Monatsschrift für Psychiatrie und Neurologie

(Vol. 27, No. 2. February, 1910)

1. Supplementary Remarks Regarding Edinger's Article, "The Rôle of Function in the Origin of Nervous Diseases." M. BERNHARDT.
2. A Contribution to the Comparative Anatomy of the Substantia Nigra, the Corpus Luysii and the Zona Incerta. TORATA SANO.
3. The Wassermann Reaction in the Cerebrospinal Fluid in Tabes Dorsalis with Remarks on the Quantitative Estimation of the Strength of the Reaction in Syphilitic Diseases of the Central Nervous System. NONNE and HOLZMANN.
4. The Technique of the Chemical and Cytological Investigation of the Cerebrospinal Fluid. SZECSEI.

1. *Function in the Origin of Nervous Diseases*.—The general trend of the article is critical, although the author states that he agrees with Edinger, Moebius and others that the continued overexertion of certain muscles in certain occupations can have a great influence in determining the localization in these muscles of toxic paralyses, particularly of lead and syphilis. Much of the article is taken up in a protest against a misquotation of an early article of the author's, by Teleky. Bernhard's experience with cases of lead palsies in file-cutters has been the contrary of other writers in that he has not found atrophy of the ball of the left thumb. The author's aim seems to be to show that there is still much to be done toward clearing up inconsistencies, before Edinger's theory can receive unqualified acceptance. He concludes by describing a unique case of occupation neurosis in a waiter, consisting of wasting and paralysis of the ulnar group of muscles in the left arm, apparently resulting from constant carrying of heavy plates and several steins of beer at one time in this hand.

2. *Anatomy of the Substantia Nigra*.—This article will run through several numbers and will be reviewed at its conclusion.

3. *The Wassermann Reaction in Tabes*.—Among 400 cases of various organic nervous disorders investigated by the authors there were 104 of tabes. They selected for publication 93 in which the diagnosis was abso-

lutely unquestionable. As Nonne had already claimed, the Wassermann reaction was found only exceptionally in the spinal fluid—only 9 per cent. as against 67 per cent. of positive reactions in the blood serum. Even where present in the spinal fluid it was always less strong than in the serum. That these results do not agree with those of others, the authors admit; but the fact that among their own cases the various forms and stages of the disease gave widely different results would account largely for the great variations in the findings of other writers. Inasmuch as all authors agree that the cerebrospinal fluid in general paralysis gives a positive reaction in 90–100 per cent of cases, while in tabes the authors find it is nearly always absent, this difference is an important diagnostic help. It does not differentiate tabes from syphilitic nervous disorders, however, for they too show the same combination of positive blood-serum and negative cerebrospinal fluid. A table of results of the quantitative estimation of the complement-binding power in the serum and spinal fluid is given. This method was originated by Zeissler and consists in titrating the reaction with varying quantities of a standard strength of complement. Five different strengths of reaction are arbitrarily distinguished. By this method the blood-serum in general paralysis was found to give a much stronger reaction than in tabes. In the spinal fluid the former exceeded the latter by about thirteen times.

4. *The Technique of Examination of the Cerebrospinal Fluid.*—Two modifications of already existing methods are given. The first consists in an aid in reading the results of the Nonne-Apelé globulin test called "phase 1." The apparatus is a pointed centrifuge tube which has graduations at its lower end by which to read the amount of globulin after centrifugation. The second modification concerns the Fuchs-Rosenthal method of counting the lymphocytes in the spinal fluid by means of a Thoma-Zeiss counting chamber. To obviate the difficulty often encountered of finding too few cells to give a satisfactory count, the author centrifuges 2 c.c. of the fluid in a narrow-pointed tube for a few moments very slowly. He then obtains the fluid from the lower end of the tube by a pipette and fills the counter from this. This concentration gives a larger number of cells and thus lessens error.

J. D. MOORE (Central Islip).

MISCELLANY

THE HYPOPHYSIS. Arthur Münzer. Berl. klin. Woch., Feb. 28, 1910.

The author offers the following conclusions: (1) The pathological conditions of the hypophysis may be an atrophic or hypertrophic process and tumors; (2) clinically it is necessary to differentiate between mechanical disturbances and functional alterations of the hypophysis; in the former visual anomalies are present; (3) acromegaly most probably should not be considered as a manifestation or result of primary hypophysis alterations; (4) quite often one finds hypophysis tumor combined with the syndrome of "dystrophia adiposogenitalis"; the cause of which is not known; (5) with diseased hypophysis other vascular glands are affected—diabetes, myxedema, etc.; (6) hypophysis tumors are operable—however the indications for such operations may be said to exist only when severe symptoms are demonstrable; (7) the vascular glands form the union of a combined system; in single glands direct and indirect functions could be separated; (8) acromegaly forms a type of a polyglandular affection.

M. J. KARPAS (Berlin, Germany).

Book Reviews

KLINIK UND ATLAS DER CHRONISCHEN KRANKHEITEN DES ZENTRALNERNEN-SYSTEM. Von Prof. Dr. August Knoblauch, Direktor des Städt. Siechenhauses zu Frankfurt a.M. Verlag von Julius Springer, Berlin. 28 Marks.

In many respects this is an extremely individualistic type of work. It is the outcome of a series of clinical demonstrations commenced by the author in 1898, and continued yearly regularly since that time, in the Frankfort city almshouse, where there is to be found an enormous amount of material illustrating chronic states of nervous disorders.

Knoblauch has here utilized the material which he has shown, and has interspersed, among the great number of exceedingly good illustrations, schematic diagrams taken largely from the works of contemporaneous neurologists, elucidating the anatomical and physiological facts necessary to an understanding of the disorders under consideration.

The author first discusses the spinal sensory segmentary innervation, taking up herpes zoster, segmentary disturbances in tabes and lesions of the cauda. Segmentary motor affections and disorders of the spinal portion of the cortico-muscular tracts are next discussed. Muscular diseases make up the third chapter. Diffuse diseases of the spinal cord a fourth. A special chapter on the physiology and pathology of the movements of the iris is interpolated, and then follow chapters on Multiple Sclerosis and Tabes. Five chapters on Diseases of the Brain follow, including Cerebral Motor Disturbances, Aphasia, Cerebral Syphilis, Encephalitis, Hydrocephalus, and Tumors. A final chapter on Hysteria and Epilepsy closes the work.

The book is, from the publisher's point of view, one of great merit. It is beautifully and copiously illustrated, well bound, and altogether an ideal volume. For the neurologist, it is an excellent collection of articles, largely cast in the lecture form, explicit and scholarly. It is not a textbook, and appeals to a more advanced set of readers.

Knoblauch has given us an admirable volume, and shows what can be done with almshouse material. It could well prove a stimulus to many who have similar opportunities.

JELLIFFE.

ÜBER DIE KERNE DES MENSCHLICHEN HIRNSTAMMS. L. Jacobsohn. Der Königl. Akademie der Wissenschaften. G. Reimer, Berlin.

In a former work, "Über die Kerne des Menschlichen Rückenmarks," Jacobsohn described in detail the grouping of nuclei in the spinal cord, and in this volume he offers the results of his studies of the position of the various motor, sensory and sympathetic nerve cells in the medulla, pons and pedunculus cerebri. He maintains that the grouping of the nuclei in the brain stem could be better studied than in the spinal cord for the following reasons: (1) the corresponding motor, sensory and sympathetic end station in the head are better outlined; (2) the centers of isolated sensory apparatus of the head are respectively represented

through isolated, sharply limited nerve nuclei, and (3) in the brain stem are found peculiar, large and small nerve cells whose nature is only partly known. The author declares that a fairly clear differentiation between motor and sensory cells could be made; the structure of the protoplasm of the former is coarsely clodded, whereas in the latter it is finely granulated. The general rule is that the nearer the cells approach the motor end station, the more transformation of the protoplasm (from finely granulated to coarsely clodded) is noted. Sympathetic cells do not permit themselves to be differentiated. We may only say that the structure of the motor-sympathetic groups has some resemblance to that of motor-somatic cell groups. However, the difficulty lies in the discrimination between sensory-somatic and sensory-sympathetic cells. The specific function of the pigment is not known. The nucleus pigmentosus subthalamo-peduncularis (substantia nigra) resembles in structure that of a motor cell; nucleus pigmentosus pontis is sensory in character; nucleus pigmentosus vagi is still doubtful. The nerve nuclei are divided in the following manner:

A. Motor groups (Endneurone), (a) near the midline and dorsal lying groups—(1) nuclei supraspinales, (2) nucleus n. hypoglossi, (3) nucleus n. abducentis, (4) nucleus n. trochlearis, (5) nucleus n. oculomotorii; (b) in the lateral tegment region and ventral lying groups—(1) nucleus motorius n. vagi, (2) nucleus retrofacialis, (3) nucleus n. facialis et nucleus accessorius n. facialis, (4) nucleus motorius retrotrigeminalis, (5) nucleus motorius n. trigemini.

B. Motor groups (readjusted neurones)—(1) nucleus motorius dissipatus formationis reticularis medullæ oblongatæ, (2) nucleus motorius dissipatus formationis reticularis pontis, (3) nucleus motorius dissipatus formationis reticularis pedunculi, (4) nucleus motorius vestibularis (Deiters's nucleus), (5) nucleus motorius cerebellaris, (6) nucleus motorius tegmento-peduncularis (nucleus ruber motorius), (7) nucleus motorius corporis bigemini anterior et nucleus motorius tegmento-bigeminalis.

C. Motor-sympathetic groups—(1) nucleus sympathicus n. vagi, (2) nucleus sympathicus n. oculomotorii, (3) nucleus motorius radice mesencephalici V.

D. Motor groups of special function—nucleus pigmentosus subthalamo-peduncularis.

E. Sensory groups—(1) nucleus sensibilis principalis n. trigemini, (2) nucleus radice descendente n. trigemini, (3) nucleus fasciculi solitarii et alæ ceneræ, (4) nucleus funiculi gracilis, (5) nucleus funiculi cuneati, (6) nucleus funiculi posterioris, (7) small (round or oval) cells of formatio reticularis and raphe.

F. Sensory pigment nuclei—(1) nucleus pigmentosus pontis, (a) nucleus pigmentosus tegmento-pontinus, (b) nucleus pigmentosus tegmento-cerebellaris, (2) nucleus pigmentosus vagi.

G. Sensory groups (distal neurones)—(1) nucleus n. cochlearis, (2) nuclei n. vestibularis, (3) nucleus marginalis corporis restiformis, (4) nucleus bulbo-pontinus, (5) nucleus externus corporis bigemini anterioris.

H. Sensory groups (readjusted neurones)—(1) nucleus olivaris superior, (2) nucleus corporis trapezoideus, (3) nucleus bigemini posterioris et corporis geniculati medialis, (4) nucleus interpeduncularis, (5) nucleus commissuræ posterioris (?).

I. To the cerebellum in relation to standing groups—(1) nucleus funiculi lateralis, (2) nuclei arciformes, (3) nucleus olivaris inferior,

(4) nucleus parolivaris medio-ventralis, (5) nucleus parolivaris dorsalis, (6) nucleus pontis, (a) nucleus tegmentosus medialis nuclei pontis, (b) processus tegmentosus lateralis, nuclei pontis, (7) nucleus rotundus subthalamo-peduncularis (nucleus ruber).

The middle large polygonal cells in the entire formatio reticularis are to be ascertained; however, the round or oval cells of the formatio reticularis are sensory in nature. Nucleus giganto-cellularis and nucleus pallidus raphes are motor. Roller's small nuclei are sympathetic. Nuclei paramedianus dorsalis, funiculi teretis and intercalatus resemble the sympathetic. The author has not determined the true nature of the following nuclei—nucleus supra-trochlearis substantiæ griseæ, nucleus tegmenti pedunculo-pontinus, nucleus peripeduncularis lateralis, nucleus internus corporis bigemini anterioris, et nucleus tegmento-bigeminalis and the cells of Griseum ventriculare.

To the serious student of anatomy Jacobsohn's valuable monographs are indispensable.

M. J. KARPAS (Berlin, Germany).

TRAITÉ INTERNATIONALE DE PSYCHOLOGIE PATHOLOGIQUE. Directeur A. Marie, de Villejuif. Comité de Rédaction: Professor Bechterew, Clouston, Grasset, Lugaro, Magnan, Pilez, Raymond, Ziehen. Tome Premier. Psychopathologie Générale. Felix Alcan, Paris, 25 francs.

This large octavo of 1,028 pages with 353 illustrations in the text, is the first of three volumes aiming to give a complete exposition of pathological psychology, not in a dictionary or an encyclopedia order, but in the form of a series of monographs designed to cover the entire subject.

Grasset, in his well-known short, terse and clear-cut style, opens with a discussion on the general relations of neurological and psychiatric medicine. He considers them as a neurobiological unit, and as would be expected insists upon the functional point of view. Del Greco's article that follows on the Critical Sketch of the History of Mental Medicine is characterized by its lack of history in the ordinary sense of the word. It is a philosophical retrospect, very diffuse and wordy, and overlooks practically all consideration of what we are in the habit of terming modern problems of psychiatry. He does not seem at all acquainted with them. Marie follows with a chapter on Anthropology, from the psychiatric view point. This is an immense monograph, copiously illustrated, with a bibliography alone of ten pages, but done in a somewhat slovenly manner, many of the references being without titles, others with incorrect citations, still others, no citations at all. The article, as a whole, is in need of condensation, of rearranging and of codification, in order to make the mass of curiosities really available. Mingazzini gives a chapter on the Cerebral Convulsions, Marie on the Chemistry of the Cerebral Substance, and then Marie and Dide on physiopathology of the functions of the skin, the respiratory and digestive organs, the kidneys, the heart, blood and circulation, and various glandular functions; all painfully superficial. Thus the section on the blood in psychiatry is farcically incomplete. Levaditi has a short addendum on Syphilis and Brain Disease.

General Pathological Anatomy in Psychiatry by Klippel, Lugaro, Marinesco, Dide, Médéa, and Laignel-Lavastine makes up Chapter VIII with much interesting material. Lugaro's section is excellent. Marinesco gives a short chapter on Architectonics, and some excellent cell studies. Laignel-Lavastine's summary of sympathetic pathology is well worth while.

Marro, in Chapter IX, takes up again his work on Puberty, but unfortunately has not seemed to progress much beyond the older standpoints. The entire series of problems regarding the relation of constitutional make up, and after developing psychoses is largely overlooked by him.

Chapter X, on Methods of Examination, is opened by Clouston. It contains little. It is followed by an extensive chapter by Bechterew with full psycho-physiological details. This contains too much. Ferrari takes up the backwards, and Carrarra the medico-legal standpoint. In none of the sections does one find any systematic discussion of methods of examining the mentally ill, in the sense that Eulenberg, Ziehen, Sommer, Finckh, Dost, Aschaffenburg, Kraepelin and others have worked out—not a word even of the excellent work of Binet, Simon, Serieux, Bourdon and Masselon, even in France. It is a strange oversight, but quite in comport with the extremely loose character of the editorial work in general.

Taken as a whole, the work is so uneven as to defy a general judgment. It has some excellent chapters, and others that are useless. Some that go into extreme and wearisome minutiae, others that entirely miss the chief interests of active workers in psychiatry, although the material should be there.

Two other volumes are announced, which must show more coördination if the treatise is to occupy a high place in modern psychiatry.

JELLIFFE.

INITIALERSCHEINUNGEN DER ZEREBRALLEN ARTERIOSKLEROSE UND KRITISCHE ERÖTERUNG IHRER PATHOGENESE. A. Pick. Carl Marhold, Halle, a.S., 1909. 0.75 M.

In this interesting brochure Pick discusses the initial manifestations of cerebral arteriosclerosis and its pathogenesis. The symptoms of cerebral arteriosclerosis are of two kinds—(1) transitory and (2) permanent. Under the first come the various forms of paresthesia (the predilection type is the ulnar region of the forearm); vertigo (except the affection of the bulbi nuclei and Deiters's nucleus, the labyrinth is also at fault), transitory speech disturbances, and paresis with corresponding paresthesiae. Somnolence is regarded a transitory symptom, while insomnia belongs to the stationary symptom complex. The transitory manifestations are usually due to cramp-like contraction of the blood vessels. The permanent symptom-complex expresses itself in the following—a rapid decline of mental productivity, inability to concentrate for new thoughts, headache, enfeebled memory, mental and physical fatigue, in some amnesia and in others psychic deafness are observed. Some patients fear that they may become afflicted with a dreadful mental disease and in consequence suicide is often committed. In the early stages affective disturbance is frequently observed—peculiar dullness of emotional reaction, depression with tendency to crying and egocentric limitation of affective life. Intracranial pressure, increased blood pressure, and anomalies of vision are frequent accompaniments.

It is interesting to note that this symptom complex usually appears primarily and is neither preceded nor accompanied by transitory focal manifestations and moreover it never terminates in a severe form of arteriosclerosis. The author is of the opinion that in cerebral arteriosclerosis Flechsig's association centers have undergone pathological changes.

M. J. KARPAS (Berlin, Germany).

UNTERSUCHUNGEN ZUR KENNTNIS DER PSYCHOMOTORISCHEN BEWEGUNGSSTÖRUNGEN BEI GEISTESKRANKEN. Dr. Karl Kleist. Verlag von Dr. Werner Klinkhardt, Leipzig. Bibliothek medizinischer Monographien. Band III.

Kleist has been a student of motor disturbances for many years. His earlier work was addressed to the choreas and now later he has taken up the psychoses. The present work is largely theoretical and is, in fact, the formulation of an hypothesis to account for the motor disturbances found in catatonia. The author believes them to be due to a disturbance in the cerebellar-frontal system. The theory is interesting, hardly more, especially in view of recent pathological findings in præcox, more particularly in the cerebellum.

WHITE.

DIE TRAUMDEUTUNG. Von Dr. Sigm. Freud. Franz Deuticke, Leipzig und Wien. 2d ed.

It is hardly necessary to call attention to this work to psychiatrists in any country further than to note the appearance of a second edition. It marks a distinct epoch in the development of modern psychopathology and is the most important, in fact the fundamental, work of the gifted and noted author. It is scarcely necessary to say that in his theory of the significance and interpretation of dreams Freud has developed the principles which have brought his psychiatry into world-wide repute. Die Traumdeutung is the portal through which to enter upon an understanding of Freudian principles. It should by all means be rendered into English, although this would be an especially difficult task.

WHITE.

UEBER DEN SELBSTMORD. Robert Gaupp. Zweite, vermehrte Auflage. Verlag der Aertzlichen Rundschau, Otto Gmelin, München, 1910.

The study of suicide is very interesting and important to the student of psychopathology. It is still a mooted question whether a suicidal act is the result of a diseased mind. It is lamentable that the solution of this difficult and serious problem is sought in statistical documents and not the study of a few well-analyzed cases resorted to. Hagen (quoted by Gaupp) remarks: "Statistics do not offer causes for the phenomenon, but only stimulation to seek causes." Gaupp, in his instructive monograph about suicide, gives firstly complete data of the statistical study of suicide, and secondly the results of his own careful and painful investigations. The gist of his monograph may be given as follows:

Suicide is on the increase in civilized countries and the Germanic race, especially, shows a great tendency towards self-destruction. Formerly the Jews rarely committed suicide, but of late it has become frequent among them. Men take their lives more often than women, and this is particularly true of the Europeans—the usual ratio is four to one. However, in Japan the number of women predominates over that of men. It is a general rule that the frequency of suicide increases with age. In children under the age of fifteen it is rare; after fifteen, with the appearance of puberty, suicide in the female is rather of relatively frequent occurrence. Suicide is seldom perpetrated by married men and women, while in childless marriages it is not rare; in the widowed and separated it is frequent. It is interesting to note that suicides occur more often in the spring and summer than in fall and winter. It is generally conceded

that religion exerts a great influence on the occurrence of suicide—for instance, it is more common among the Protestants than the Catholics, and the Jews show a relatively smaller figure than the Christians. Suicide is more frequent in large cities than in villages, and is greater in rich districts than in the poor. The educated take their own lives more often than the ignorant—the more illiterate the less suicides. Artists, merchants, wholesale dealers and the learned form a high percentage, and the clergy a low figure. Suicide is rather oftentimes committed by servants, prisoners and soldiers—in the last the ratio is eight (soldiers) to one (civilian) in Austria and two to one in Germany. The method of taking one's life varies in different countries—the Germans and Japanese prefer hanging; the Italians and Spaniards rarely choose but in the latter shooting is preferable; the English and Swedish resort to poison and it is said that this method is eight times more frequent than in Belgium and France. As a rule, women prefer poison or drowning; young women and children resort to jumping from the window. Griesinger said that "the more unusual and cruel is the method of self-destruction undertaken, the more ground exists to consider the act being the result of a morbid mood."

There is a custom in München to admit every attempted case of suicide to the Psychiatric Clinic, and thus Gaupp had the opportunity to study one hundred and twenty-four cases during the years of 1904, 1905 and 1906. Of this number sixty were men and sixty-four were women, and only one of them was well mentally. They may be classified as follows:

WELL-MARKED PSYCHOSES.

Dementia præcox	11
Manic depressive insanity	17
Senile psychosis	4
Alcoholic psychosis	4
General paralysis	1
Feeble minded	7

NOT WELL-DEVELOPED PSYCHOSES.

Epilepsy	12
Hysteria	10
Chronic alcoholism	28

The author is of the opinion that suicide is the result of a diseased mind and in his own words: "The facts teach us that suicide almost always originates from morbid states. And they teach us something else—namely, how people deceive themselves by believing that they can clearly perceive in their consciousness causes for their actions. Suicide is a social, a biological, and finally a psychological problem. It runs through a people according to laws, whose effects show us very distinctly the results of the statistics, and whose nature and content we commence to apprehend now."

M. J. KARPAS (Berlin, Germany).

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Original Articles

A REPORT OF THREE PRE-FRONTAL TUMORS¹

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The following cases are of interest both because of the symptoms present and because of the large size of the growths.

CASE I. C. J. L., age 59, male, white, bookkeeper, consulted the writer October 23, 1909.

Family History.—The family history was negative save that both the patient's mother and maternal grandfather had died of disease of the heart.

Personal History.—The patient had had the ordinary diseases of childhood. He had always been delicate but had not passed through any serious illness confining him to bed. At the age of nineteen, however, he had had a hemorrhage apparently from the lungs which followed severe muscular exertion.

In November, 1904, he was thrown from a wagon, striking upon the left side of the back of the head. He became unconscious and was taken to the Pennsylvania Hospital. There was some bleeding from the left ear. He remained at the hospital one week. Subsequently he was apparently well and experienced no ill-effects from the accident. His wife, however, thought that since the accident he held his head inclined somewhat toward the left.

In June, 1906, and again in January, 1907, he suffered from a moderate hemoptysis and he at various times complained of pains which he referred to his chest.

Present Illness.—In the summer of 1909 he was obliged to do an unusual amount of work and became much exhausted. He noted that he could not do his work as well as formerly. This

¹ Read at the thirty-sixth annual meeting of the American Neurological Association, May 2, 3 and 4, 1910.

was observed by his employers, who relieved him for a time from his duties. Subsequently he resumed the latter for a time but felt that his efficiency had not been improved.

On October 12, while at his home, he suddenly suffered from a seizure during which his left leg jerked. His wife, who was nearby, thinks that the left arm was also involved. He was not unconscious. Afterward the left side felt strangely; as he expressed it, it was in some way affected. He did not complain of headache nor was there any history of vomiting. Mentally he seemed somewhat obtuse and was distinctly slow in his replies.

Examined October 23, the following notes were made:

Station normal. Gait normal, save that he walks with a decided droop of the left shoulder. There is no weakness of either leg. The grip is good with either hand; somewhat less in the left than in the right, though not disproportionately so. He disclaims any sensation of weakness in the left side. There is no astereognosis. The tongue is protruded in the median line and is slightly tremulous. The lips are protruded firmly. The angles of the mouth are retracted equally well. Palpebral fissures are equal, pupils are equal and respond promptly to light and accommodation. The knee jerks are both somewhat plus. There is no ankle clonus and no Babinski sign.

The general visceral examination revealed a double mitral murmur with sharp first and second sounds and a pulse of low tension. An examination of the chest by Dr. S. Solis-Cohen revealed some retraction both above and below the clavicles on both sides; also dulness over the upper portion anteriorly. No rales could be made out but expiration was somewhat harsh and prolonged. The Moro test made subsequently gave positive results.

An examination of the urine was negative.

On October 26, Dr. H. F. Hansell made an examination of the eyes and reported that there was no evidence whatever of increased intracranial pressure, that both fundi were normal and that there was no contraction of the visual fields; further that the muscles of the eyes were normal and that the pupils were equal and responsive.

On the same date Dr. S. MacCuen Smith made an examination of the ears and reported that he could find nothing abnormal; he did not think it likely that the hemorrhage from the left ear which occurred at the time of the fall from the wagon had been due to a fracture.

On October 28 he was again reexamined by myself. His wife reported that he had been in a "dreamy" state of mind and that he seemed to have no idea of time. She states, for instance, that he remained in the toilet for as long as three quarters of an hour when formerly he would remain but a few minutes; also that it takes him a very long time in the morning to dress; that he will

brush a piece of clothing or one part of a garment mechanically and for a long time. He is distinctly dazed and she thinks at times confused. She cannot trust him to go out alone. He does not seem to know what he wants to do. His wife adds also that at table he eats mechanically. He now eats in large quantity where formerly he was a light eater. He often forgets what he is doing; at times he does not seem to know just where he is; sometimes loses himself in his own house.

He does not retain his urine well; he not infrequently soils his clothing. His wife states further that he does not seem to notice the change in his condition; that he does not manifest any anxiety about himself. He does not worry and assumes no responsibilities regarding his affairs.

No seizures or convulsive movements have occurred since his previous visit. In reply to questions the patient now says that he has headache and that he has had it for three or four days. Asked to indicate its position, he places his hands on the top of his head. There has been no vomiting.

The patient's appearance is that of a person who is slightly dazed and his expression is somewhat vacant. The general physical examination reveals the same facts as before; no modifications of reflexes, no local weakness and no changes in gait or station. His pulse rate is 72.

On October 30 the patient was again examined. In reply to questions he again says that he has headache which he now refers to the frontal region and to the vertex. He is, as before, slightly dazed and confused. He answers questions slowly.

No sensory anomalies are noted and there is no involvement of the sphincters save that he sometimes urinates involuntarily; there is also marked delay in micturition.

The patient now passed from under my immediate observation, but from his family and family physician, Dr. Frank Lehman, of Bristol, Pa., it was learned that his mental condition slowly and steadily became more pronounced. He gradually became very somnolent, more confused and incompetent; could no longer feed himself, became bed-ridden and stuporous and finally died of exhaustion on December 4, 1909. Upon one occasion only had he vomited.

An autopsy was performed at his home by Dr. John Funke, pathologist of Jefferson Hospital; the autopsy was limited to removal of the brain.

A horizontal section of the brain just below the level of the corpus callosum revealed a large tumor in the right frontal lobe. It was situated well beneath the cortex and did not involve the basal ganglia or capsule. The anterior limb of the capsule and head of the caudate nucleus appear to have been slightly displaced by pressure. The tumor is of irregular rounded shape, measuring 5 cm. in its largest diameter. A microscopic examination reveals it to be a round cell sarcoma.

CASE II. C. B., female, age 18, single, white, was admitted to the Jefferson Hospital, November 2, 1909.

Family History.—The family history is practically negative. The father died of disease of the heart; two brothers of causes unknown; while the mother and one brother are living and in

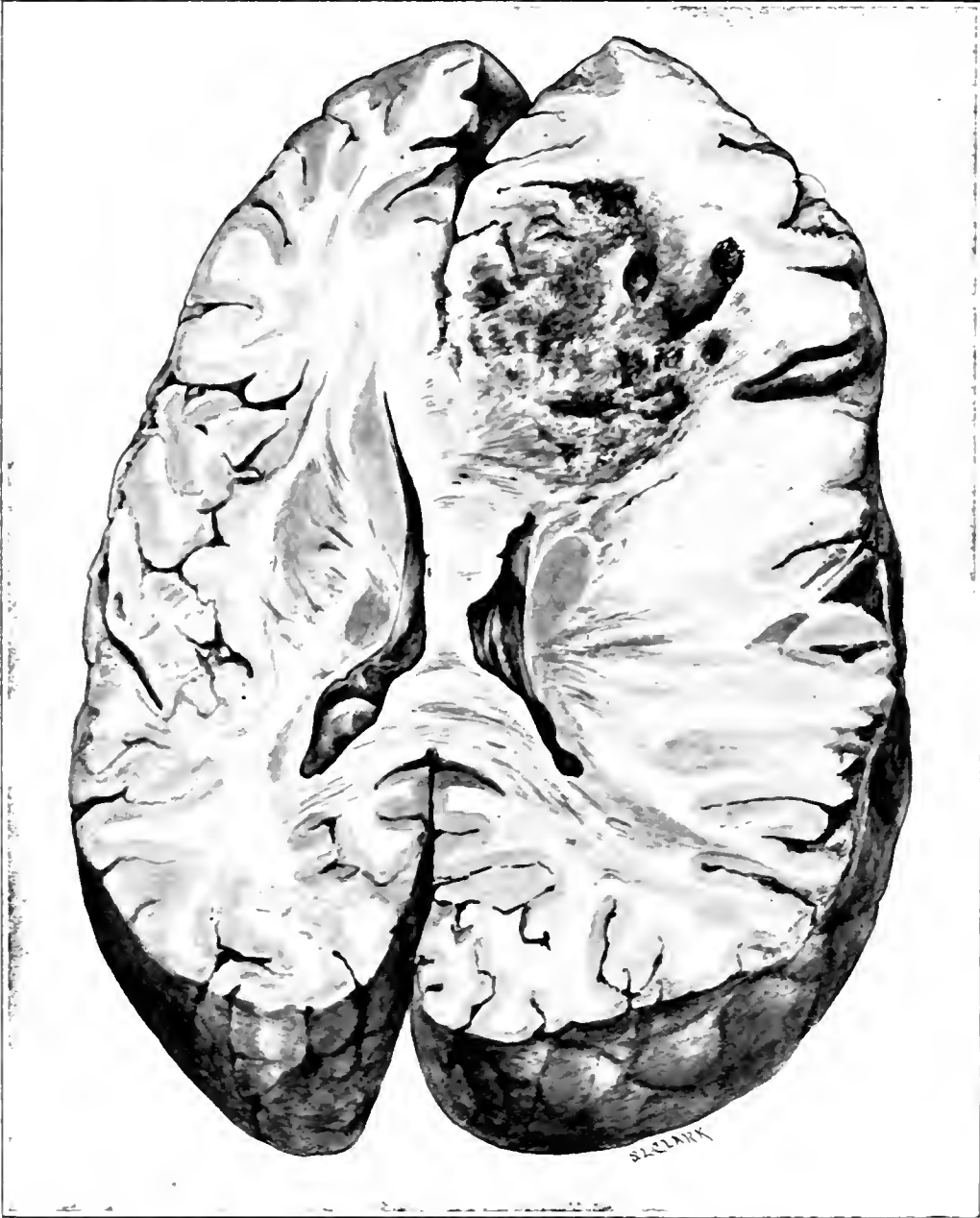


FIG. 1. Case I.

good health. There is no history of renal, pulmonary or malignant disease in the family.

Personal History.—The personal history is also largely negative. The patient has always enjoyed good health until the onset

of the present trouble. Does not remember ever having had any of the infectious diseases of childhood. Menstruation began at the age of fifteen; was regular and painless.

Present Illness.—The first signs of the present illness began four weeks before admission to the hospital. The patient was seized with a very severe headache which began in the frontal region, but soon spread over the head. The headache became constant and was accompanied by vomiting. At times the patient would vomit only once a day and at other times she would vomit almost an entire day. The headaches were subject to severe exacerbations which were often ushered in by a chill—apparently a “nervous chill”—and accompanied by a sensation of chilliness. She also suffered frequently from dizziness and this became so severe that if standing or walking, she would frequently be obliged to sit down. Two weeks before admission she began to suffer from pain in the left upper extremity, the pain extending from the fingers to the elbow. Subsequently she also had pain in the left leg and this leg she states was somewhat painful on pressure. She rapidly lost strength. Her appetite continued good and her bowels regular. There was no history of convulsive seizures. Mentally she was dull and apathetic. She lay still in bed, not speaking unless spoken to; was somewhat somnolent. When roused spoke slowly but was able to give a tolerably clear account of her case.

Condition on Admission.—The patient was a fairly well-developed and well-nourished girl of eighteen. Her face had rather a dull and heavy expression. The skin was dry and warm. The subcutaneous fat was abundant, the musculature was firm and respiration, pulse and temperature were normal.

Station was almost though not quite normal. It was a trifle unsteady, especially with eyes closed. Her gait was normal save that she tended to deviate toward the left.

There was a slight flattening of the lower half of the right side of the face. This flattening was not marked but it was quite distinct. When her facial muscles were called into play, the mouth would be distinctly drawn to the left; occasionally also slight muscular twitchings were noted on the left side. Together with the weakness on the right side of the face, there was present a slight though unmistakable weakness of the left arm and left leg; that is, there were present the signs of a crossed hemiplegia, slight in degree. There was no tremor nor was there any ataxia. The tendon reactions were equal and normal upon both sides. A Babinski was absent upon both sides. The cutaneous reflexes were present on both sides. The sphincters were normal.

An examination failed to reveal the pain upon pressure in the left leg of which the patient complained. It did, however, reveal hyperesthesia over the left arm and over both legs. It also revealed typical areas of painful hyperesthesia under both breasts

and over both groins; also a limited area over the left parietal region. No other sensory anomalies were discovered. Tactile, temperature and pain sensations in regions elsewhere than the regions described were normal. Stereognosis was normal in both hands.

An examination of the eyes on November 3, 1909, by Dr. Le Fevre reveals a slight exophthalmos; also a pseudo-ptosis, though there is not present a true paralysis of either levator. Only one quarter of the normal visual acuity is present. Both the pupils dilate to 5 mm., but do not react to light and but slightly to accommodation and convergence. Accommodation is not paralyzed and the extraocular muscles do not seem to be involved. Both nerve heads are swollen, the left more than the right, the swelling amounting to several diopters, the exact number being impossible to determine on account of the patient's failure to fix. Both retinæ are edematous with engorged and tortuous veins. Nystagmus is not present.

An examination of the hearing, smell and taste reveals negative findings.

Speech is slow though not otherwise affected. Mentally, though the patient answers her questions fairly well, she seems dull and heavy.

The general visceral examination is negative. The tongue is dry and coated but reddened at the tip and edges. While the buccal mucous membrane is pale, the fauces are normal and the tonsils are not enlarged. There are no palpable lymph nodes and there is no enlargement of the thyroid gland. Examination of the lungs, heart and blood-vessels is negative. The abdomen is somewhat distended and tympanitic and tenderness appears to be present on deep palpation over the spleen and liver. These organs are, however, not enlarged.

Examinations of the urine and of the blood were negative.

Because of the very positive character of the symptoms, a decompressive operation was urged but at the time declined.

Reëxamined upon subsequent occasions, it was found that the paresis noted in the left extremities varied at times. On December 6, for instance, it was much less perceptible than previously. The hyperesthesia over the left arm and leg had, however, become more marked. A typical Babinski sign had also been added to the other symptoms already present. There was no change, however in the tendon reflexes.

Reëxamined on December 6 by Dr. Le Fevre, it was noted that the pupils now fail to react both to light or to convergence. Both pupils are equal, being about 6 mm. in diameter. There is an absence of converging power and a failure to abduct either eye past the primary position. Abduction is limited one half in both eyes. There is a slight rotation in the vertical axis. Vision has become much diminished. There is light perception but she

can no longer count fingers. The right nerve head is swollen four diopters; the left nerve head six diopters. In other words there is present a marked double optic neuritis, palsy of both external oblique muscles and paresis of all the other ocular muscles. Nystagmus is not present.

Consent to operation was finally obtained. Because of the

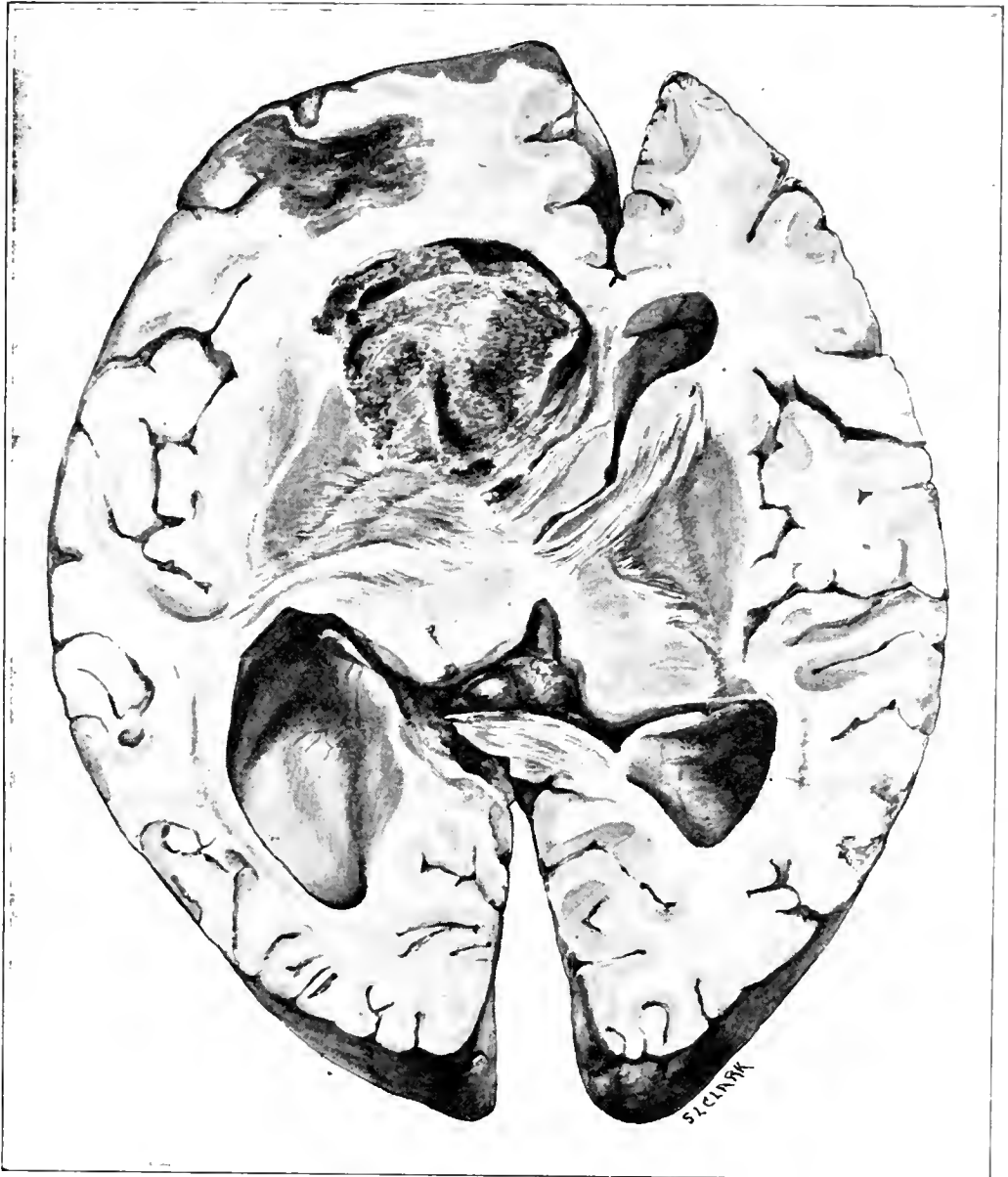


FIG. 2. Case II.

symptoms of crossed or alternate hemiplegia, slight though they were, it was thought not unlikely that the tumor was in the right pontine angle, and accordingly on December 8, Dr. F. T. Stewart made a free sub-tentorial exploration on the right side, but no tumor was found. Though the hemorrhage was not excessive,

the patient did not rally from the shock of the operation and died on the following day.

At the autopsy it was found that "the left hemisphere is distinctly larger than the right. The anterior portion of the parietal lobe just anterior to the Rolandic fissure, bulges, but, on pressure this bulging disappears; the convolutions are somewhat flattened. On separating the hemispheres, slight bulging is noticed on the mesial surface of the left frontal lobe just anterior to the genu of the corpus callosum. The pia and arachnoid are somewhat adherent to the brain substance along the mesial edge of the left hemisphere."

A horizontal section of the cerebrum revealed a large tumor deeply imbedded in the left prefrontal region. It measures 4.3 cm. in its greatest diameter. It evidently interfered by pressure with both the anterior portions of the caudate nucleus, of the lenticula, and of the anterior limb of the capsule. The slight paresis of the right lower face was clearly a distance symptom as was also the slight and transitory weakness of the left leg and arm. Just why the last mentioned symptom should have been present and upon the left side is somewhat difficult to explain.

A microscopical examination revealed the tumor to be a round cell sarcoma.

CASE III. M. S., age 32, white, single, male, merchant, was brought to the writer for examination by his family physician, Dr. Louis Jurist, on December 7, 1909.

Family History.—The family history was negative save that several members were nervous and that a younger brother had died of tuberculosis.

Personal History.—Patient was apparently well at birth. In childhood had measles and scarlet fever from which he apparently made good recoveries. Had typhoid fever at about fifteen; again made a good recovery without sequelæ. Some years ago while riding a bicycle at Atlantic City, struck his testicles, bruising them severely. They became much swollen and the left testicle subsequently atrophied. He was confined to bed for about five weeks.

About March 1, 1908, he sprained his ankle but was well again in a few days. He has had no other accidents. There is no history of any infection.

One evening, in July, 1908, while sitting on the steps of a club house, he suddenly "fainted." He lost consciousness and when he came to found that he had bitten his tongue. He did not soil his clothes. He says, however, that he has passed water into his bed several times in his sleep during the past year; that recently in the day time while riding in a train, he lost control over his bladder and wet his clothes. He says that he felt the desire but could not relieve himself quickly enough; says he knew what was happening. About two months ago he was in a

barber's chair being shaved. He told the barber to hurry as he felt that his bowels would have to be moved. In a moment or two he asked the barber to stop but before the latter could do so, his bowels had moved into his clothes.

Upon one occasion he walked into a post at his place of business and in various ways betrayed either gross inattention to his surroundings or marked failure of vision. It was noticed also that his capacity in business had suffered decidedly and that he had also become increasingly indifferent to business. He was finally persuaded to consult Dr. George E. de Schweinitz, which he did on November 30, 1909. Dr. de Schweinitz discovered a double optic neuritis and at once referred him to his family physician. Though warned as to the extremely serious nature of his condition, he did not give the latter an opportunity to make an examination until some two or three days had elapsed. He failed to appreciate the gravity of his condition; and the anxiety of his relatives made no impression upon him.

Present Condition.—In answer to questions, he states that he has had headache off and on, but that he has not had any headache for the last two weeks. Thinks he has not suffered from headache to any marked degree. About five years ago he suffered from dizziness. Has not suffered from dizziness lately. During the last few weeks he has had ringing in the ears. For about two weeks he has noticed that he cannot read as well as before.

The patient's answers to questions are somewhat variable and he is at times distinctly confused. He smiles readily and seems quietly pleased. He manifests no anxiety as to his condition. He asks no questions.

Physical Examination.—His gait is normal; there is no difficulty of station and he maintains his weight equally well upon either leg alone. A little intention tremor is present in the hands but it rapidly disappears. The grip is normal. The knee jerks are double plus; the left more so than the right. The right tendo Achillis jerk is prompt and perhaps a trifle plus. The left tendo Achillis jerk is decidedly plus. There is no ankle clonus, no Babinski or other reactions upon either side. The plantar reflex is a little more active upon the right side than upon the left, the toes being flexed more decidedly. The biceps and triceps reactions both are plus; a little more so on the left side than on the right. Jaw jerk active but not plus. The palpebral fissures are unequal, the right being a trifle larger than the left. The right eyeball is a little more prominent than its fellow. The naso-labial folds are equal. The angles of the mouth are retracted equally and the tongue is protruded normally; it is also held steadily without tremor. The countenance is somewhat full as though the features were slightly tumid.

There are no sensory anomalies, though the patient complains of a slight numbness of the fingers of both hands.

A small lipomatous mass, about an inch in diameter, freely movable, is found in the flexure of the left elbow. A similar though smaller mass is found in the flexure of the right arm. A small lipoma is also found in the right hypochondrium and another small lipoma on the outer aspect of the upper third of the right thigh. There is also a small scar in this situation from which a former lipoma has been removed.

The patient weighs 170 pounds. His height is five feet ten and a half inches.

The general visceral examination was negative.

Dr. de Schweinitz reported "Double choked disc, the surface of the swelling being about 3.50 to 4 D., about .50 D. higher on the left than on the right side; no hemorrhages and no macular figure, but the veins exceedingly dark. Vision is reduced to two-sevenths of normal in the right eye and two-thirds of normal in the left eye. The field of vision shows that there is a little tendency, in addition to general contraction, to symmetrical cuts on the nasal side, as if there might be a basal lesion to account for this, although of course exactly the same sort of cuts would be produced by the neuritic process. An interesting observation is the distinct exophthalmos of the right eye. Measured with Hertel's instrument, the proptosis is 20 mm., as compared with about 14 mm., or practically normal, on the left side."

The diagnosis of a probable frontal tumor was made and the patient was admitted to Jefferson Hospital on December 8. Here the previous findings were confirmed. Especially was this true of his mental condition. Thus it was noted that he dresses and undresses slowly, that he plays with the water in the wash basin and forgets to wash himself. Again, when he attempts to take a bath, he allows the water to enter the tub, may get into the tub, may stand in it and then may get out again, forgetting to bathe. At one time a brother came to see him and immediately afterwards he asked that his brother be sent for; he had forgotten that his brother had just called. He was also somewhat somnolent.

There is no history of any disease of the ears nor has the patient suffered from any affection, as far as can be learned, of the nasal passages, that is, there has been no history of recent cold or catarrhal discharge. Dr. S. MacCuen Smith made an examination of the ears and of the various sinuses of the skull. His examination failed to reveal any infection of these structures.

A Nogouchi-Wassermann test was made and proved negative.

On December 10 he was seen by Dr. M. Allen Starr in consultation and at this time the slight predominance of the tendon reactions upon the right side, noted at previous examinations, was not evident. Subsequently the difference in the tendon reactions of the two sides was again noted.

On December 11 a free decompression was made in the right temporal region by Dr. John H. Gibbon.

The immediate effect of the operation was to somewhat diminish the amount of swelling without improving the vision.

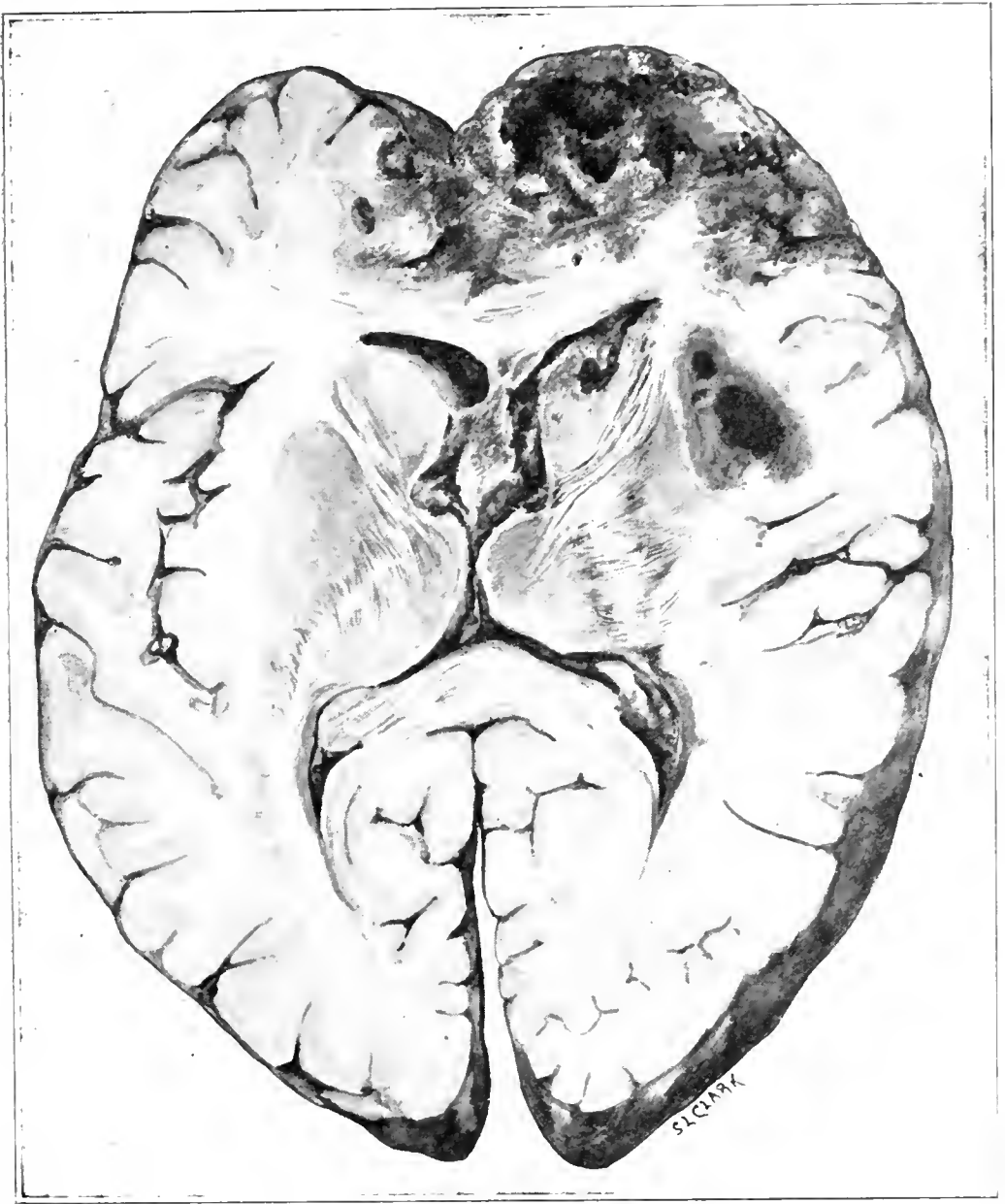


FIG. 3. Case III. Extensive destruction is shown in the right frontal lobe, also in the adjacent portion of the left frontal lobe; there is also a large area of softening adjacent to and involving the anterior portion of the right lenticula, and another in the caudate nucleus.

The latter continued slowly but unmistakably to fail. On December 22 he was seen by Dr. George W. Jacoby. The symptoms noted previously were confirmed. Finally consent was secured for a radical exploration of the right frontal region.

This was undertaken by Dr. Gibbon on December 26 and resulted in the removal of a large tumor weighing $7\frac{3}{4}$ ounces. The histological examination revealed it to be an endothelioma.

The following are the notes on operations performed by Dr. Gibbon:

The first operation, December 11, 1909, was one of simple decompression for the purpose of preserving what remained of the sight, while a further attempt was being made to definitely locate the tumor.

Under chlorid of ethyl-ether anesthesia, preceded by morphia and atropin, a subtemporal decompression was done. The opening was nearly circular and measured $2\frac{1}{2}$ inches in diameter. The dura was divided along the lower half of this opening and allowed to retract to the upper portion. There was very marked intracranial pressure but no area of hardening could be felt and pulsation was distinct. An excellent exposure of the temporal region was obtained by retracting the split temporal muscle. The muscle was accurately approximated over the protruding brain and the wound closed without drainage. The operation was brief and the convalescence was perfectly satisfactory.

Second Operation, December 26, 1909.—Some temporary improvement in the eye condition followed the decompression but as other symptoms of compression developed it was finally determined that an exploration of the right frontal lobe should be done. A stereoptican X-ray plate, made by Dr. Manges, showed a peculiar irregularity in the thickness of the frontal bones which we were unable to interpret. It was determined to make a keystone-shaped osteoplastic flap hinged at the line of the decompression opening. The operation was performed under morphia-chlorid of ethyl-ether anesthesia. As soon as the soft parts were divided along the middle line a number of large veins were exposed and rough bone encountered: these conditions were most marked at about the point of juncture of the frontal and parietal bones. The skull along the median line was extremely thin, at one or two points being no thicker than blotting paper. The dura was not adherent to the bone. The bone was cut with a Hudson bur and forceps. When the flap was turned back the under surface of the bone was rough and very irregular. The brain pulsated but in spite of the decompression an abnormal amount of tension was present. A large dural flap was reflected, its base being at the line of decompression. Marked protrusion of the brain took place when the dura was removed. On examining the mesial aspect of the frontal lobe a large projecting tumor could be seen and felt. The overlying brain in front of the tumor was normal though thin, and could be lifted up and the tumor seen beneath it. The tumor was found on exploration to be an enormous one, extending all the way down to the base of the skull, where it was adherent.

and over to the left side of the median line for about an inch and a half or two inches; no difficulty was experienced in separating it except at the base and on the left side. A profuse hemorrhage was expected, probably from the cavernous sinus, when the tumor was separated from its attachments below, but we were agreeably surprised to find that there was comparatively little bleeding when the tumor was removed. On examining the tumor, which

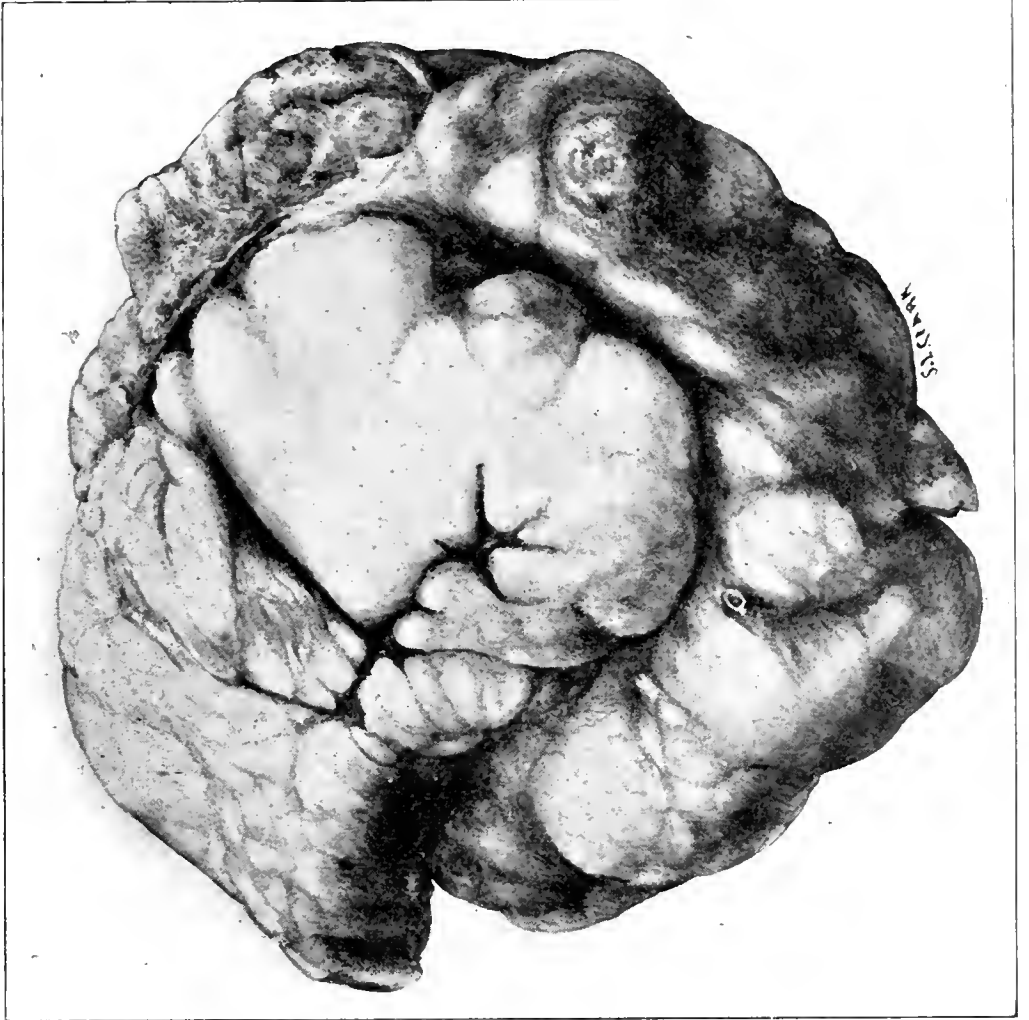


FIG. 4. Tumor removed from Case III. Dimensions of tumor: $9\frac{1}{2}$ cm. long, 9 cm. broad, 6 cm. thick, 29 cm. circumference. Weight $7\frac{3}{4}$ oz.

was the size of one's fist, the enucleation seemed to have been complete, but on exploring the cavity a small portion of the growth, which was quite free, was found. The tumor was the largest the operator had ever seen. The enormous cavity left after the removal of the growth could be considerably diminished by compressing the protruding brain at the site of the previous decompression. The skull on the left side of the median line, for

about an inch and a half, or two inches, presented much the same condition as that on the right side, but there were many elevations and depressions. It was this condition of the skull which the X-ray plate showed and which we were unable to interpret. Two gauze drains were introduced into the cavity because there was some oozing, and a similar one placed against the longitudinal sinus where there was a little bleeding. The dura was completely and accurately closed excepting at the point of drainage. The entire operation occupied one hour and four minutes and at the conclusion the pulse rate was 80 and the patient's condition excellent.

December 28, 1909.—The patient has done remarkably well since the operation. On recovering consciousness it was noted that he had a palsy, although not complete, of the left arm and leg, but in the course of six hours this had nearly disappeared. Since the operation the temperature has ranged between 100 and 101°, and the pulse rate has been very rapid, ranging between 144 and 115°. He has been perfectly quiet and slept a great deal, although his answers to questions are very much slower than formerly; at the same time they are more responsive and it would appear that his mental condition is much nearer the normal than before his operation. He has had nearly constant dribbling of urine but not the dribbling of retention. There has been considerable oozing but no bleeding. The original packs were removed to-day.

January 8, 1910.—At the end of a week after the operation the patient's condition was remarkably satisfactory, temperature normal and pulse slow, and we felt hopeful of his recovery. His mental condition was better than it was before the operation and in every respect he was in good shape. About this time, however, he began to develop a rise in temperature and slept a great deal. Thinking that there might be some accumulation in the wound I explored it thoroughly with my finger but found no pus. A large quantity of necrotic brain tissue escaped at each of the recent dressings. For the last four days the temperature has remained between 105 and 107°; there has been no evidence of any accumulation and the discharge from the wound is made up of serum, brain tissue and blood. The patient died this morning. The post-mortem examination revealed considerable softening and necrosis of the left frontal lobe, together with a well-marked pachymeningitis over a limited area in the left frontal region. No accumulation of pus was found in the skull.

The symptoms present in the above cases are of unusual interest. Vague mental symptoms were present in all of them. Case I, indeed, suggested symptoms not unlike those of profound cerebral exhaustion or indeed of a beginning paresis. The headache had never been a marked feature of the case and was only elicited

by questioning. It existed only for a short time previous to his death; vomiting occurred but once and that only toward the very close of his illness. The absence of optic neuritis was also remarkable, as was also the absence of any involvement of the visual fields. The only symptom which was at all suggestive was the one attack of slight twitching of the left leg and possibly twitching of the left arm which occurred a few days before he came under observation; the attack was very brief in duration and was not attended by loss of consciousness. Occasionally psychic vesical incontinence was present.

In the second case there was early present headache, optic neuritis and vomiting, all of the symptoms being typical and marked. The feature of special interest is the slight flattening of the lower half of the right side of the face and the equally slight involvement of the left leg and arm. These symptoms, as already suggested, were in all probability due in part at least to indirect pressure. The subjective sensory disturbances in the left leg and left arm, namely, pain and the hyperesthesia of the left arm and both legs, are somewhat difficult to explain. The occurrence of typical areas of hysterical painful hyperesthesia under both breasts and over both groins is exceedingly interesting and important and must be borne in mind in considering the other symptoms present. The area of hyperesthesia upon the left parietal region was also small and resembled in other respects an area of hysterical hyperesthesia, though it was present on the same side as the tumor; the question arises whether the left hemiparesis, present for a time only, was not also hysterical in origin.

In Case III optic neuritis was pronounced. Headache was scarcely, if at all, present. Vomiting was absent. Case III is remarkable for the size of the growth which had probably existed for a long time previous to the seizure which occurred in the summer of 1908. That so large a growth could have been present and the patient still have been able even in a degree to attend to his business and ordinary affairs is very remarkable. Finally, the resemblance of the mental symptoms in Cases I and III to those of paresis is worthy of comment. Case I was placid, indifferent and did not manifest the least anxiety as to his condition. Case III was at times distinctly expansive, good-humored and not infrequently laughed and joked. Case II, though quiet, complained at times greatly of suffering; at no time was she jocose

nor was there any tendency to laughter or hilarity. Again indifference to the sphincters was not observed. Finally, there were no epileptiform seizures. The eye muscle symptoms made their appearance late and are probably to be referred directly to the frontal lobe lesion; in part they may have been due to the blindness and the absence of fixation.

In many respects the above cases conformed to the ordinary observations made in prefrontal tumors. This was particularly the case as regards the mental symptoms which were most marked in Case III, less marked in Case I and least in Case II. Psychic incontinence was pronounced in Cases I and III. Epileptiform seizures were present but once in Cases I and III and absent altogether in Case II. Optic neuritis was present in Cases II and III, and absent in Case I; the swelling was more marked on the side of the tumor in Case II and slightly greater on the side opposite the tumor in Case III. Local tenderness of the skull was present only in Case II, was on the same side as the tumor, but was parietal and not frontal.

Finally, it is interesting to note that in only one of the cases, Case II, was there present any ataxia. In Case II the patient in walking deviated toward the side of the tumor.

It should be added that no X-ray examination was made in Case I. In Case II an X-ray examination was negative. In Case III an X-ray examination was also negative save that it revealed some irregularity of the inner surface of the frontal bone upon the right side; also some apparent thinning of the bone. The possible etiological value of trauma is well illustrated in Case I.

SARCOMATOSIS OF THE CERVICAL DURA SUGGESTING HYPERTROPHIC CERVICAL PACHYMENINGITIS¹

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The following case is interesting both because of the diagnosis and because the affection of the dura was probably secondary to a sarcoma of a rib.

M. M., female, age 52, widow, was seen in consultation with Dr. Philip Marvel at Atlantic City, March 30, 1908.

The family history was negative as regards nervous and mental disease and as regards malignant disease. The personal history was uneventful and without significance. She had had no previous illness of moment and had had two healthy children.

The patient stated that she was well up to February 17, 1908, when at a social function she felt as though she had taken cold. She felt some stiffness and pain in the back of the neck and shoulders. The pain and stiffness gradually became more pronounced; and she was sent to Atlantic City and placed under the care of Dr. Marvel. On March 3 Dr. Marvel noted that the pain was present in both arms, both shoulders and in the chest. The patient was very nervous and despondent. On March 8 a herpetic eruption made its appearance on the right forearm and pain in the back of the neck was especially noted. Subsequently the pain persisted with very little variation, being at times more pronounced in the left arm, at times in the right arm and shoulder and at others equally on both sides. Soon it was noticed that the arms and shoulders were smaller in size and that the arms were very weak.

Examined with Dr. Marvel the patient is found lying in bed. The muscles of the shoulder girdle, arms, forearms and hands are much wasted. The wasting is diffuse in character. The wasting resembles that seen in hypertrophic cervical pachymeningitis; it is noted, however, that the supinator longus and other muscles of the radial supply on both sides are also much atrophied, a feature that is somewhat unusual in hypertrophic

¹Read by title at the thirty-sixth annual meeting of the American Neurological Association, May 2, 3 and 4, 1910.

cervical pachymeningitis. The arms are excessively weak, the patient being hardly able to move them. Fibrillary twitchings are not noted.

The patient complains of severe pains, burning in character, in both arms, more marked at present, she thinks, in the left arm than in the right. She also complains of pain, less marked, in both groins. The nerve trunks are not tender to pressure. There is hypesthesia of both upper extremities. This hypesthesia is marked and is for all forms of sensation; complete loss of sensation is not present. The hypesthesia exists over the upper portion of the chest and extends upward to a level of about an inch above the clavicles and surrounds the base of the neck like a collar. It appears to be equally pronounced on both sides. It fades in a downward direction upon the trunk to about the level of the nipples. Whether it is present in any degree lower on the trunk or lower extremities, it is difficult to determine. However, no decided loss was at this examination found in these portions of the body. There are no sensory losses whatever upon the neck above the level named nor upon the face or head. The patient is able to move her legs though they also are weak. There is no involvement of the sphincters.

There is also marked rigidity of the back of the neck so that it is not possible to raise the patient's head from the pillow. When the attempt is made it gives rise to excruciating pain.

The patient is perfectly clear mentally. Her voice is weak. She can, however, chew and swallow her food without difficulty. There has been general loss of weight and there is marked general weakness. The pupils react both to light and accommodation. They are equal and present no irregularities.

The reflexes of the arm are lost. The knee jerks can be elicited with difficulty. Ankle clonus is not present. Babinski sign is absent. Tongue protruded in median line. Angles of mouth retracted equally well.

The pains from which the patient suffered were evidently root pains, while the peculiar collar-like distribution of the upper level of the anesthesia was likewise to be explained by root involvement; indeed it pointed directly to involvement of the sensory roots of the fourth cervical segment while the extension of the sensory losses over the arms and upper portions of the trunk pointed to involvement of nerve roots lower down. The fact that the muscular wasting included among other muscles also the supinator longus pointed to the fifth cervical segment or its motor roots. Finally the rigidity and pain upon movement pointed to a meningitis. Tumor was considered and discussed but because of the diffuse character of the symptoms thought less likely. The diagnosis of a cervical meningitis, a pachymeningitis, was considered probable. The differences from the usual picture of hypertrophic cervical pachymeningitis and from the

usually slow course of the latter was recognized. There was also an absence of any ascertainable cause; the patient herself believed that she had taken cold.

Reexamined April 16, 1908, with Dr. Marvel, there is extreme general emaciation. Wasting of the muscles of the shoulder girdle and of the arms is now very pronounced. The wasting of the hands is also marked. The patient is somewhat obtunded mentally and is too weak to speak. No satisfactory sensory examination can be made. She is still able to swallow liquid nourishment. The sphincters are both involved. No tendon reflexes can anywhere be obtained; the Babinski reflex also is absent. Pulse and heart's action excessively weak.

A rise of temperature was noted April 24, and continued until a fatal termination set in. It was variable in course and ranged from 99° to 104° and 105° . Just before death it rose to 107° . A marked decubitus 13 cm. \times 10 cm. made its appearance some time before death.

The patient died May 28, 1908. At the autopsy, made by Dr. John Funke, there were found subacute pyelitis with beginning acute parenchymatous nephritis; hemorrhagic and purulent cystitis. In addition there was found on the right seventh rib, extending from the costochondral margin backward for a distance of 6 cm. a mass rather soft and grayish-white in color. Subsequent examination of this mass revealed it to be an osteosarcoma. Grayish-white nodules were also found in the liver; upon section they were found to be distinctly circumscribed and they were likewise found upon subsequent examination to be sarcomatous.

The brain and cord having been removed, a mass was found within the dura in the region of the fourth and fifth cervical vertebræ. It occupied the anterior aspect of the dura extending laterally a little more toward the left. This mass is 6 cm. in length, 4 cm. in breadth and 1.5 cm. in thickness. In its coarse appearance it resembles the mass found on the rib and also the nodules found in the liver.

A microscopic examination reveals the nodule to be a mixed cell sarcoma. It is situated anteriorly and extends laterally a little to the left; the symptoms were from the beginning bilateral, especially the pains. Distinct localizing symptoms, pointing to a spinal tumor were not present and the general histological examination at the various levels of the dura confirm this view. The lateral and posterior aspects of the dura show marked infiltration; the dura is everywhere much thickened and for some distance below the mass, small sarcomatous deposits and infiltration are met with. At the level of the nodule, the cord is anteriorly somewhat distorted. The roots both anteriorly and posteriorly have been much compressed and are here and there involved in the sarcomatous deposits. The cord itself also shows changes.

Its peripheral portions show marked nuclear infiltration. The latter is marked in the course of the blood-vessels and along the connective tissue septa. The cells of the anterior cornua are diminished in number, often show loss of cell processes, or are small and changed in shape. In other words the changes in the cord are those of a myelitis. There are present also, in large numbers, throughout the cord, though mainly in the course of the vessels, so-called colloid bodies. The latter resemble those found in other degenerative affections of the nervous system.

LAMINECTOMY FOR POSTSYPHILITIC NERVE ROOT PAIN

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In December of 1907 Doctor —— called for consultation. He was much alarmed by the presence of certain paresthesias that had suddenly appeared in the right leg and foot, and to a less extent in the hand and arm and trunk on the same side, and very slightly in the left leg and foot. He had been infected with syphilis about twelve years previously—obstetric case. The paresthesias were not in themselves very annoying but he was worrying greatly over what he believed to be the origin of them. He thought he had tabes.

We could demonstrate no pronounced objective sensory changes. The pupils reacted normally (?) (later they were sluggish to light). There was no defect of station, no coördination disturbance of any kind. The knee-jerks were present and not plus. There was no pain in the lower extremities or elsewhere. After several visits he was persuaded that he did not have tabes. Our opinion at this time was that the symptoms were due to luetic meningitis. He agreed to a rigorous course of mercury by injections or by inunctions. He was made to understand that the early or former treatment of his syphilis had not been up to modern standards.

He did not report again for about two months, when he came complaining greatly of severe and recurring paroxysms of pain confined to the right fifth and sixth thoracic segments. The pain was accompanied with hyperesthesia which lasted after the pain turns were over. The paresthesia in the extremities had almost disappeared. There were no objective sensory signs except the hyperesthesia in the pain area, above referred to. The patient was greatly discouraged. He admitted, however, that he had not come up to our requirement in the way of treatment since his last visit, although he had taken quite a number of injections.

He agreed to go to the hospital for rest and thorough treatment. He entered April 13, 1908, and remained 49 days. During this time he received 18 injections of a grain each of the benzoate of mercury. He showed the effects of the drug on the gums, and occasionally slightly by intestinal irritation. In addition to the injections he received a hot bath and general massage almost daily and was in the air constantly. His general condition improved greatly, but there was no abatement of the thoracic pain. It was of a severe type. It sometimes subsided largely when he was in complete repose in bed, but returned with every kind of physical activity. Before he left the hospital a lumbar puncture was made and four drachms of fluid taken with no effect of any moment.

In June he went abroad. He spent most of the summer at Aachen, where he took two thorough courses of mercurial inunctions. After the first of these he consulted Professor Erb and also Doctor Bingswanger. They both assured him that he did not have tabes. They advised a second course at Aachen, and both advised a laminectomy following this second course unless meantime there was relief from the severe pain. A successful X-ray picture revealed nothing.

The patient gained about twenty pounds while abroad and returned in October looking much improved. There was no abatement of the pain. Before he left to go abroad we had discussed the question of laminectomy and he felt that he would submit to it if not relieved of pain during the summer. After returning, however, he procrastinated and allowed himself to get involved in his practice to some extent. Although suffering greatly he acquired no actual drug habit but he occasionally took some opium. During most of the time that we were familiar with his case he took some iodide, but never in large doses. It disturbed his stomach greatly and he never carried it beyond 30 grains t. i. d. and most of the time much less than that amount.

Examination, November 11, 1908: He is 64 years of age, of good physique and has been actively engaged in medical practice for almost 30 years. There is nothing of moment in the family or personal history except the fact of syphilitic infection twelve years ago, followed by mild constitutional symptoms, for which he has never taken very thorough treatment.

The region of pain is included in the area of the fifth and sixth thoracic segments, and posteriorly running over into the seventh. Over almost all of this area there is so much hyperesthesia that he cannot bear friction from soft clothing. The dragging of cotton wool across the area is almost intolerable. At the upper edge of this hyperesthetic area there is a strip of hyperalgesia. In this area the slightest touch of a pin point is extremely painful. This hyperesthetic zone extends from the

median line in front to within four inches of the median line of the back. At this point it breaks into scattered points of hyperesthesia ranging from the lower part of the fourth, through the fifth, sixth and seventh segments.

At this time a careful physical examination revealed no objective signs beyond those found in the zone just described. He complained of some paresthesias, especially about the right shoulder and the soles of both feet. These were apt to be more pronounced on awakening in the morning.

There was a marked sluggishness in the light reflex of both pupils. The knee-jerks and other tendon reflexes seemed about normal. The right abdominal reflex was absent.

On the morning of January 27, 1909, he was operated on by Doctor H. G. Mudd: a laminectomy of the third, fourth and fifth dorsal vertebræ. The cord was well exposed. When the dura was opened there was a gush of spinal fluid under high pressure. The fibers of the fifth posterior thoracic nerve root were bound to the dura by strong adhesions so that a careful dissection was necessary to release them. The fourth and fifth were severed close to the cord. The third and the sixth roots seemed to be quite free and were not molested.

The patient seemed to stand the operation fairly well, but in the afternoon the breathing and pulse were so poor that collapse was feared. In the evening he was very much better. He was not only free from pain, but gentle percussion over its old site, and the vicinity of it, caused no uneasiness.

After midnight he rapidly grew worse again and died in collapse about 3 A. M.

Remarks.—In view of the clinical history and pathological finding our interpretation of the case is that there was a diffuse mild luetic meningitis (posterior) more pronounced on the right side (he had some paresthesia in the left lower extremity). There was at least one focus, namely, the fifth thoracic posterior root where the process was too intense to yield to natural or medicinal processes of relief. It was a sear so to speak of a luetic lesion.

This seems theoretically possible at least. Clinically, however, it cannot be a very frequent phenomenon among the spinal nerve roots or there would be more frequent cases of this description. The severe pain in this case persisted for something like ten months.

We have all seen instances of some similarity clinically to this one, namely, cases in which the pain crisis of tabes came so often and lasted so long that the patient was in pain much of the time, but with distinct intermissions of variable duration. This patient had practically no intermissions. With rest in bed and limited activity there was some abatement of pain but it was continuous and the paresthesia and hyperesthesia ever intense.

RADICULITIS¹

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Inflammations of nerve roots comprise a group of clinical entities of special interest and importance, from diagnostic, prognostic and therapeutic view points.

Under the title "Les Radiculites"² Dr. Paul Camus, interne in the service of Professor Dejerine, has recently, in a monograph of 130 pages, treated the whole subject in a comprehensive yet concise manner.

Camus recognizes various forms or subgroups, according to the region affected and the symptoms predominating—as, for example, sensory and motor forms—cervical, lumbar, lumbosacral, sacro-coccygeal, as well as cranial and disseminate forms. The case here reported is a combination of sensory and motor types, and is cervical in location.

I desire to express my obligations to Dr. Robert H. Butler, clinical instructor in the University of Cincinnati, Department of Medicine, for translations from the original monograph of Camus. Also to Drs. D. F. Gerber and E. D. Allgaier, internes, and to my son, Fletcher Langdon, interne-elect in the Cincinnati Hospital, for various notes and observations contributed.

CASE REPORT.

C. W. White, American, aged 33, married; he has two children said to be healthy. No history of miscarriages.

Occupation.—Foreman and time-keeper for a contractor on out-door work in the country.

Was admitted to the neurological service of the Cincinnati Hospital, October 12, 1908.

¹Read at the thirty-sixth annual meeting of The American Neurological Association, May 2, 3 and 4, 1910.

²Paris, J. B. Bailliere et Fils, 1908. See also Review of Neurology and Psychiatry, Edinburgh, January, 1909, p. 66.

Complaints.—Paralysis of both arms and both legs. Marked limitation of all neck movements. Some difficulty in swallowing at times.

Family History.—Unimportant.

Personal History.—Includes syphilis about seven years ago. No history of any injury or fall. Uses very little alcohol; tobacco rather freely.

Present Illness.—Onset of present disability has been extremely gradual, dating from fourteen months prior to his admission to hospital. The first symptom was severe shooting pains in left side of neck, radiating to occipital and temporal regions. There was also at this time a feeling of numbness in the left face, extending to line of scalp, and most marked in the left temporal region. This pain and accompanying numbness were worse on arising in the morning. After the pain had existed for about four weeks, he consulted a physician in the country, who made some electrical applications, which gave him some relief. More or less pain and discomfort persisted, however, for about nine months, and gradually increasing rigidity of neck and head movements was evident.

During this period numbness, tingling and weakness in the left forearm and hand made their appearance and in eleven months after the original onset he lost all use of this limb below the elbow. Previous to complete loss of power in left forearm and hand, or about ten months after the original onset, he noted a slight stiffness in the left knee and ankle and the toes "stuck to the ground" occasionally, causing him to stumble. Twelve months after onset the right arm tingled, the right index and middle fingers were numb, and grasping power in the right hand was markedly reduced. He continued to use a lead pencil, however, in his daily work up to the fourteenth month of the disease, though he could not button his clothes. At about the fourteenth month the right knee was somewhat rigid and the right toes tended to "stick to the ground in walking." Unable to walk or to use a pencil as his work required he was compelled to give up his position and applied for admission to the hospital as noted. Although paralyzed in all four extremities one could not accuse him of lack of "nerve."

EXAMINATION: OCTOBER 12, 1908.

Patient is a white man, height 5 feet 7½ inches, weight 115 pounds. Spare in build, fair muscular development; muscles wasted and flabby in arms, not so in legs. Complexion dark brunette, with straight black hair, and dark eyes. Cachetic color, apparently anemic. A smooth bossy projection can be felt on left side of neck at about the junction of third and fourth vertebræ; it is not painful or tender to touch.

The heart, lungs and digestive organs present no anomaly.

The urinalysis is negative, pathologically.

Blood Examination.—October 22, 1908, Hn. 90 per cent., R. 5,160,000, W. 12,000, polymorphs. 78.5 per cent., lymphocytes large, 3.5 per cent., small 14 per cent., trans. 4 per cent.

CRANIAL NERVES.

I. No defect noted.

II. Ordinary vision good, no diplopia, no fundus changes.

III–IV–VI. Pupils: Right slightly larger than left; both responsive to light and accommodation. The left normally, the right rather less quickly.

Ocular movements free in all directions. Slight nystagmoid jerking in extreme lateral movements of globes.

V. No defects noted.

VII. Left lower face appears slightly weak. He can not elevate the angle of mouth on this side.

VIII. No defects of hearing noted.

IX–X–XI. Occasional dysphagia. No voice changes.

XII. No deviation or wasting of tongue.

TRUNK AND EXTREMITIES.

Sensory Symptoms.—Slight, consisting of slight losses of tactile sense over ill-defined areas of left thorax; uncertainty to heat test over right abdomen and right lower thorax, with uncertainty or lack of appreciation of both heat and cold over palmar surfaces of both hands; tactile sensation being good everywhere, excepting as noted over left thorax (see chart, Fig. 1).

Motion.—Head and neck: rotation of head almost absent; flexion and extension slightly better. Head habitually held so that the face is directed slightly to the right.

The almost complete abolition of all head and neck movements appears to be due to articular obstruction, not muscular paralysis or spasm.

A bossy protuberance, feeling somewhat cartilaginous, situated on the left side of neck, appears to protrude from the interval between the transverse processes of the third and fourth cervical vertebrae.

No muscular spasm in neck. Trunk movements are little if any impaired.

All movements of upper and lower extremities can be executed, but feebly and awkwardly.

The arm movements are flaccid. The leg movements spastic. Patient walks also with difficulty and is liable to fall if not assisted.

The left thumb and little finger can barely be approximated. Grasping power is reduced about 50 per cent. in right hand and 80 per cent. in left.

DYNAMOMETRIC REGISTRATIONS

Oct. 22 R 27 k,	L 10. k
Oct. 26 R 30 k,	L 10. k
Nov. 6 R 34 k,	L 10. k
Nov. 24 R 32 k,	L 15. k

See also later tests.

Instrument used was the standard dynamometer made by Nar-ragansett Machine Co. of Providence, R. I.

While wasting of arm muscles is evident, no muscle appears completely powerless.

Fibrillation and tenderness on pressure are not present.

Owing to temporary disability of the electrical apparatus, the muscles were not tested for R. D., but the irregular distribution and incompleteness of the paralysis would seem to render the presence of R. D. improbable, or at least difficult of demonstration, owing to the diffuseness of the wasting and the fact that no one muscle or group of muscles was completely paralyzed.

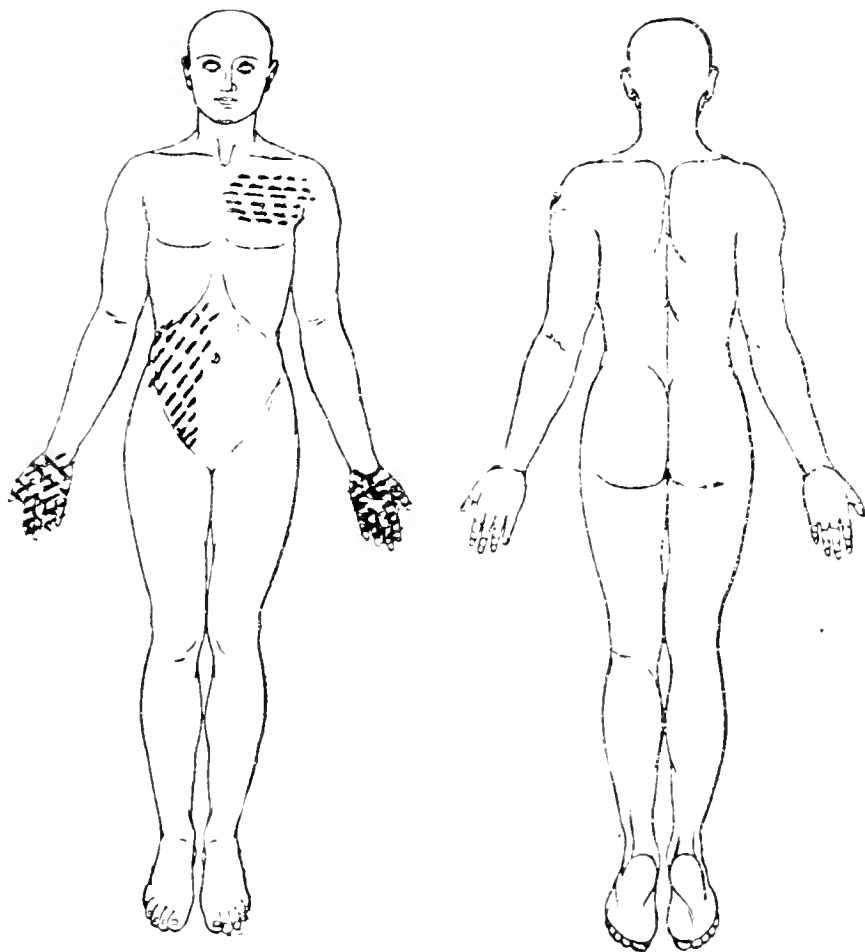


FIG. 1.

== Tactile sensibility diminished.

/// Thermesthesia uncertain ; cold good.

... Heat and cold both uncertain.

REFLEXES.

Organic.—Occasional difficulty in swallowing. No sphincter defects.

Tendinous.—Knee-jerks somewhat plus, the left more so than the right.

Patellar clonus absent.

Foot clonus absent.

Cutaneous.—Plantar reflex marked *extensor*, right and left (Babinski sign).

Gordon and Oppenheim reflexes absent.

DIAGNOSIS.—Myelitis and myelomalacia are readily excluded

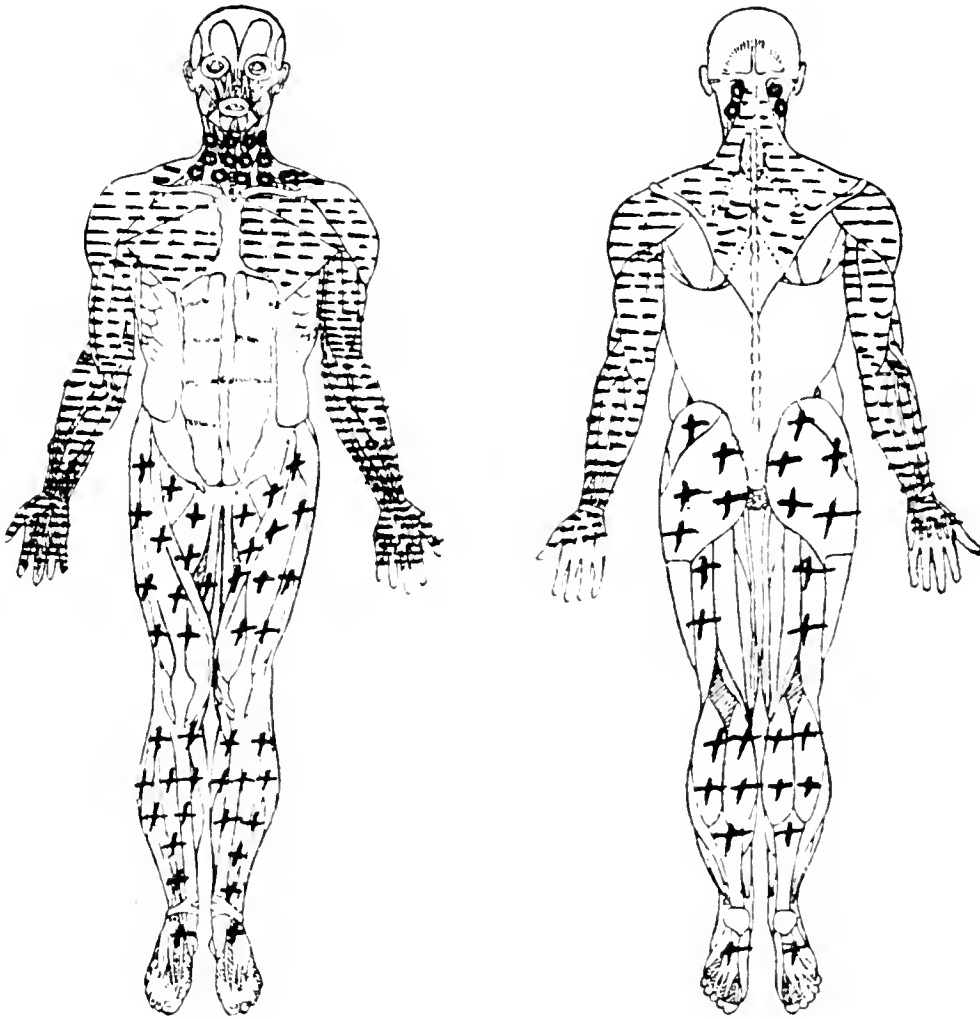


FIG. 2.

ooo Movements abolished.

≡ ≡ Flaccid weakness all movements.

++ Spastic weakness all movements.

by the extremely chronic onset, the trifling sensory defects, the steady increase in disability and its degree; with absence of sphincter involvement or trophic ulcerations.

Neuritis is also excluded by the distribution, order of progress and the spastic feature in legs. Also by absence of intramuscular tenderness.

Myopathy is negatived by the age and history.

Myelopathy, by distribution, order of progress and absence of fibrillation.

Syringomyelia is excluded by the slight degree of "dissociation symptom" and the lack of complete anesthesia to any form of sensation.

Tabes is mentioned by Dejerine amongst the conditions to be excluded, but this seems unnecessary in this case. The remaining possibilities are pachymeningitis and meningeal tumor.

It is obviously both: in the sense that an exudate sufficient to compress nerve roots of both upper extremities and at the same time compress the lateral tracts of the cord so as to cause degenerative pyramidal tract changes and spastic lower extremities, must be considerable in mass as well as in extent.

This is further shown by the protrusion between the third and fourth cervical vertebræ of the bossy swelling referred to previously and the almost complete immobility of the articular processes. Syphilis, tuberculosis and secondary malignant disease are the usual causes of nontraumatic pachymeningitis.

The history, progress and absence of fever, the absence of evidence of bone disease, pus, or softening, practically exclude tubercle. Malignant disease of meninges of cord is usually secondary to new growths elsewhere, extremely painful, and disabling at an early date.

The diagnosis of gumma, therefore, seems warranted by exclusion.

The Wassermann test was not available at the time, and does not appear necessary to a diagnosis.

TREATMENT.—Mercury by inunction, alternating with iron; good diet, and general supporting measures were ordered.

Improvement was steady and uninterrupted.

In about a month patient was walking freely about the ward, his gait stiff, but toes not "digging in." He can use a knife and fork fairly well. Head movements of flexion, extension and rotation are somewhat more ample in range. Grasp is R. 32, L. 15, a gain of nearly 20 per cent. in right hand, and of 50 per cent. in left hand. The left thenar muscles are flat and wasted and he cannot approximate thumb and little finger with any force.

Blood Examination.—November 18, 1908, Hn. 80 per cent., R. 3,120,000, W. 5,660, polymorphs. 73 per cent., lymphocytes large, 17 per cent., small 8 per cent., eosinophiles, 1 per cent., mast cells, 1 per cent.

Improvement continued uneventful and steady to March 29, 1909, on which date he left the hospital at his own request.

Notes taken at this time show: Weight 140, a gain of 25 pounds in 5½ months. Pulse 96, regular, temperature normal. Power: Grasp R. 45, L. 28. Coördination defect in touching nose with finger—slight in right hand, 2 to 3 inches error in left.

Patient served on a jury for a time.

Was kept under observation at intervals and the same treatment continued.

July 6, 1909, is back at his old occupation of foreman and time-keeper at full wages and doing full work. Neck more movable—but movements stiff and restricted in range. No “boss” detectable on palpation. Walks well and has full use of hands and arms for all movements and uses. No obvious muscular atrophy. Grasp R. 48, L. 32.

March, 1910—one year after discharge from hospital—is still working at his usual occupation of foreman and can shovel and use tools with either hand and take the place of any man in his gang, if short of help. “Feels fine.”

Lateral rotation of head from center point at chin—3 inches to right; 2 inches to left. Some subjective numbness left hand and wrist. No objective sensory defects.

Motor coördination and localizing sense good. Weight 154, a gain of 39 pounds. Grasp R. 43, L. 38. (Normal estimated at about 50 and 45 for him.)

Reflexes: Jaw-jerk not obtainable. Triceps and supinator jerks good. Left slightly greater than right.

Knee-jerks: active, moderately plus and equal.

Ankle clonus absent.

Plantar: flexion, both sides present; active on the right; less so on left foot.

Patient writes with a clear, smooth flowing hand, with no hesitation or tremor.

GENERAL REMARKS

Exception might be taken to the designation of the case as radiculitis, since the nerve root involvement is obviously secondary. In fact the present writer, in collaboration with Dr. A. H. Freiberg, has recorded a very similar case in all essential particulars except causation, under the title “Pachymeningitis Spinalis Externa.”³

The underlying cause in that case was inferentially, either the gonococcus or tubercle bacillus.

Recovery was good in six months excepting slight impairment of head movements.

In that case syphilis could absolutely be excluded—by reason of the fact that the patient a few months after his recovery contracted a typical “initial lesion” followed by classic secondary manifestations for which he came under the observation of my colleague, Dr. Freiberg.

A feature of interest in all these cervical meningeal inflammations pertains to the location of the exudate. I have assumed that it was “external” that is, in the epidural space between the spinal dura and the periosteum.

³ Langdon and Freiberg, Jour. Am. Med. Asso., August 26, 1899.

Recalling the anatomy of the region—it will be remembered that the intra-cranial dura splits into two layers after entering the spinal canal—this splitting occurring at the foramen magnum (Gray) or as far down as the third cervical vertebra (various authors).

It is obvious that here is a very inviting cul-de-sac, filled with loose connective tissue supporting large veins which would furnish a very favorable nidus for microbial protection and proliferation.

Extension of the ensuing exudate would be very likely along the dural sheaths of the cervical and brachial nerve roots as well as around the articular processes. Hence the cervical “boss” and the marked limitation of neck movements.

Another reason for the assumption of an external dural location of the exudate is the absence of the excruciating pains which almost invariably accompany invasion of the lepto-meninges. As regards the objection that the radiculitis is not “primary” that applies equally to myelitis, encephalitis and neuritis—since the non-vascularity of the neurone precludes a primary inflammation.

The nomenclature is simply of topographic significance and clinical convenience.

KERNIG'S SIGN: ITS PRESENCE AND SIGNIFICANCE IN GENERAL PARESIS AND ARTERIO- CAPILLARY FIBROSIS¹

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Every physical sign in disease, even if not always pathognomonic, is often of value in aiding us in our conclusions in the difficult and at times obscure cases, therefore all of them deserve our attention, and many times our consideration, both in their presence and absence, as helping to make up or modify the symptom complex of disease. As it has always been the clinicians' purpose to know every possible condition in which previous described signs or symptoms might be met with, that he might avail himself of their aid by inclusion or exclusion in his daily attempts at diagnosis of disease in its many and varied forms, I desire to call your attention to the possibility of the further application of Kernig's phenomenon, and at the same time to add additional evidence of its being almost, if not fully pathognomonic of inflammatory changes in the pia mater as first described by Kernig in his original and subsequent description of the sign.

In 1884, Kernig (1) published in the *Berliner klinische Wochenschrift*, a phenomenon which he thought was found only in affections of the pia mater, in inflammation of that membrane, and applied by him in his observations in the epidemic forms of cerebrospinal meningitis, and Herrick (2) says that until Netter, fourteen years later again described the presence of the phenomenon, little or no recognition was given to this most valuable sign. Bull (3), about one year later, in the *Berliner klinische Wochenschrift* stated that it was his belief that it was not pathognomonic of meningitis or even pial trouble, but merely indicated an increase in intra-cranial pressure, and he cited three

¹ Read before the Philadelphia Neurological Society, January 28, 1910.

cases in which he found the flexor contracture sign as proof of these statements as follows: One (1) tuberculous meningitis without autopsy; one of solitary tubercle of cerebellum, but "in the pia over it, a few miliary tubercles" with tuberculosis in the lung, lymph glands, kidney and intestine; one (1) otitis media with caries of the petrous portion of the temporal bone and thrombosis of the transverse sinus and common jugular veins, in the basal pia; especially over the frontal lobe there were ecchymoses, and there were a few teaspoonfuls of serum in the posterior fossa.

These cases, Herrick says, go further to prove Kernig's statement that his sign is found with affection of the pia mater than Bull's that it is not an indication of meningitis, or even of involvement of the pia.

Friis, later in his article also differed with Bull that the phenomenon was due to intra-cranial pressure, and as proof quoted a case of hydrocephalus in which he failed to find Kernig's phenomenon. Later, Netter again writing, stated his belief that its presence permitted one to assert quite positively the existence of a meningitis and from its presence in convalescence, Kernig, Hensch and Netter thought it might be of service in enabling one to make a retrospective diagnosis.

Then follow numerous other writers confirming the value of this sign in the epidemic and tuberculous meningitis, and later Sailer (4) reported three cases in which the sign was present unilaterally in hemiplegia and pneumococccemia, and at the same time Shields (5) reported his observations in one hundred cases, other than meningitis, in which he also found the sign; in three cases the phenomenon being unilateral, and in two cases bilateral; it was present in two uremias, two hemiplegias. Clark's (6) report is included with these; three cases of meningitis in which the phenomenon failed to manifest itself throughout the course of the disease. Later, Wilson (7) in an article upon the negative value of Kernig's sign in 120 non-meningitic cases, quotes 26.8 per cent. of the series, in which the phenomenon could be demonstrated, as against Miller's 28.6 per cent. of similar cases, indicating that there need be no serious brain or cord involvement to produce the phenomenon, and to this I desire to add my observations of the phenomenon in general paresis and in arterio-capillary fibrosis.

My attention was called to the presence of Kernig's phenomenon in general paresis in attempting to reach a conclusion as to the presence of a super-added infectious meningitis in a case of general paresis, and reflecting that as we have a leptomeningitis in paresis, we should also have this phenomenon present. Sometime during the course of the disease and examination of the cases, I confirmed this deduction, and confirmed the observations of Kernig, Netter, Friis and Sailer in other conditions in which the phenomenon was reported, that its persistence varies when frequent observations are made in individual cases; the degree of contracture also varies at times. And here I might further add that the phenomenon may be used as an indicator of the progress of the disease, as it appears with more regularity and also a greater degree of contracture as the disease progresses, and surely remains more constant in the later stages than in the earlier.

With a view of attempting to satisfy myself as to the conditions that might account for the presence of so large a percentage as recorded by Miller and Wilson in their reports of supposed normal individuals who presented this valuable phenomenon, I decided to examine normal cases, normal in the sense that they presented no apparent clinical evidence of meningeal involvement, and in so doing my attention was early directed to the presence of the sign in senility as compared to earlier life, and with further examination and observation I found that in no case where I could exclude fibrosis by palpation of radials, palpation and observation of visible or tortuous temporals, could I demonstrate a true Kernig phenomenon.²

Owing to many new problems arising, I can only make my report preliminary to a more careful and detailed study of this valuable phenomenon in arterio-capillary fibrosis. The problem of deciding why certain cases of fibrosis should present the

² One should avoid confusing a *voluntary Kernig sign*, "a coined term for benefit of description" with the true Kernig phenomenon. A voluntary Kernig sign is present in negativism of the insane, and also present in the cases where the patient fails to cooperate with the examiner. Simple methods of excluding this are by the amount of force with which the leg rebounds when pressure upward is suddenly withdrawn, most marked in the voluntary Kernig state, little resistance noted in true Kernig phenomenon; by marked resistance in voluntary sign in attempting to elicit same, and by the presence of the Kernig phenomenon when the thigh is only partially flexed, "not at right angles." Complete extension of leg is readily obtained in this position in true Kernig's state. Kernig's phenomenon persists in voluntary Kernig's state.

phenomenon, others not, confronted me. Was it an evidence, as Bull claimed, of pressure, as would result in contracture as the result of cerebral fibrosis, and would the phenomenon be the key in deciding the amount of cerebral involvement of fibrosis of the vessels with its consequent atrophy? Here I feel that Somer's admirable work in the abstract compilation of 1,180 autopsies at the Norristown (9) Asylum, aids us. Somer's work shows a large percentage of meningeal involvement in some form associated with fibrosis, and to me appears to be the cause of the presence of this phenomenon; also to confirm Kernig and his followers as to its presence indicating some inflammatory changes in the pia mater, and still further to enable us to say which of our cases of fibrosis has cerebral involvement, the nature of it, and the degree. Here I might add that there appears to be a greater degree of contracture in some of the more marked cases of sclerosis.

I will make no attempt this time to account for the presence of meningeal changes in certain cases of fibrosis, though to me there remains some facts to be explained: Why should certain cases of fibrosis show meningeal changes? What is the nature of it and the cause? What amount of meningeal change is necessary to produce the phenomenon? Is location of the meningeal change a factor in the production of the sign? Is the sign present preceding the ability to demonstrate fibrosis? What means should we or can we employ to prevent or limit its appearance? What rôle does lues play in these cases? Would the Wassermann reaction in these cases add any light? And one may go on still further, though at this time I do not deem it necessary to do so, as I feel these questions open a field for further investigation that surely is a broad one, the results of which at this time can only be problematical.

A few remarks of my observation as to the recently described phenomenon of Brudzinsky as described in the *Children's Archives of Medicine*, Paris, October, 1909.

Brudzinsky describes a flexure movement (10) in ankle, knee and hip joint, which he calls the contra-lateral sign, produced upon the forcible flexion of the head upon the chest, and states it to be more constant than the Kernig and Babinski phenomena in tuberculous and epidemic forms of meningitis.

In my observations in general paresis and other cases, I

fail to find the phenomenon, though I do find frequently, especially in the early stages of paresis, what apparently is a modified sign, probably due to similar causes that produce Brudzinsky's phenomenon.

I find in forcible flexion of the head upon the chest a contracture of the muscles on the anterior aspect of the thigh, and at times one can see distinct contracture of the sartorius and gracillis muscles; at other times a contracture of all the muscles on the anterior aspect of the thigh including movement of the patella.

I have examined seventy-five cases of general paresis; in these I could demonstrate Kernig's phenomenon in sixty-three cases, but not in twelve cases. The latter were all early cases, examined but once for the phenomenon, and most likely if examined at frequent intervals would show the sign. Many of these cases have been examined frequently and as previously noted the degree of contracture varies at times. I have examined fifty non-meningitic cases, of which fourteen cases presented the sign, all of these presented evidence of fibrosis, the remaining about equal in number with and without fibrosis, all failed to present the phenomenon. Three cases of uremia also examined presented the phenomenon.³

Through the courtesy of Doctors Spiller and Burr, I have examined twenty-three cases of *tabes dorsalis* in their wards at the Philadelphia Hospital, for Kernig's phenomenon, and in five of these cases the phenomenon could be demonstrated. Though in all five cases there could be no question of the presence of arterio-capillary fibrosis, in fact in two cases it was pronounced. In no case could the contra-lateral sign be demonstrated.

In conclusion, I will say that at some period in the course of general paresis, one will find Kernig's phenomenon present. It is always present in the late stages of the disease. As to its

³ Since presentation of this paper a necropsy has been obtained in one case of sclerosis reported in this series of cases, in which the clinical diagnosis of arterio-capillary fibrosis, in a man sixty-five years of age, was confirmed at autopsy, and in addition an acute hemorrhagic pachymeningitis, that covered almost the entire cerebrum on its superior surface, involving the pia, was found; no involvement of dura was apparent in the case; no other clinical symptom of meningeal involvement other than Kernig's phenomenon presented itself before death. It has also been my privilege to see a case in which Kernig's phenomenon could be demonstrated in a man thirty-three years of age in which there was marked fibrosis of the radials and temporals, latter firm and markedly tortuous, urinary findings of chronic interstitial nephritis, history of lues questionable.

presence in arterio-capillary fibrosis, and its significance, to me it appears to be an evidence of meningeal involvement, the nature and extent of which I am at this time unprepared to say.

I desire to express my thanks to Dr. Spiller and Dr. Burr for the courtesies and privileges extended me in their wards.

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Society Proceedings

AMERICAN NEUROLOGICAL ASSOCIATION

THIRTY-SIXTH ANNUAL MEETING HELD IN WASHINGTON, MAY 2, 3 AND 4, 1910

The President, DR. MORTON PRINCE, in the Chair

The President, Dr. Morton Prince, of Boston, delivered an address entitled: "Cerebral Localization from the Point of View of Function and Symptoms with special reference to von Monakow's theory of Diaschisis." (*See this Journal*, p. 337.)

Dr. F. X. Dercum, of Philadelphia, read a paper entitled, "A Report of Three Pre-frontal Tumors." (*See this Journal*, p. 465.)

DISCUSSION

Dr. E. W. Taylor, of Boston, said that the two main points that Dr. Dercum brought out were of much interest. In the first place the mental condition; in the second place, the epileptiform seizures. From what Dr. Dercum said, and Dr. Taylor presumed it would be generally accepted, there is no definite type of mental disturbance in relation to frontal lobe lesions. The mental condition in Dr. Dercum's cases was one of irritability. Dr. Taylor recalled distinctly a patient in whom the mental symptoms had nothing of this character. The man was a young army officer previously healthy who developed rather insidiously an extraordinary state of apprehension with various phobias which had become a source of great annoyance to him. In general he presented all the appearances of a psychasthenic state, and such a diagnosis was made provisionally. This patient also had slight epileptiform convulsions which in view of the entire clinical picture were misinterpreted and regarded as hysterical. The patient disappeared from view for some months, continuing his work in the army with effectiveness. He later developed definite tumor symptoms and died. The autopsy showed an extensive prefrontal tumor, gliomatous in type, and very difficult to distinguish from the brain itself. The points of importance in the case as in Dr. Dercum's were the incidence of slight seizures, epileptic in character, and even more confusing, and the development of a neurosis which had all the characteristics of an ordinary psychasthenia and which was benefited by purely mental treatment.

Dr. Edward B. Angell, of Rochester, N. Y., said he had been very much impressed with the cases of prefrontal tumor, especially in the lack of symptomatology. Many of these cases occur without headache, nausea, vomiting; without any of the motor symptoms, and without any of the hemiplegias or disturbances of one side of the body usual in brain tumor. A case came under Dr. Angell's observation one year ago; a successful and very intelligent business man suddenly became apathetic, and his family first noticed his condition because he received news of a desirable promotion with unconcern and paid no attention to it. Aside from that condition he had no symptoms whatever. He was not in stupor, and

responded to questions promptly, and had no optic neuritis. He had had an attack of grippe, and had considerable nasal discharge with an increase in the white blood cells by count. Here was a case where there was reason for believing an acute trouble existed by extension from the nasal chambers. The mental symptoms were not such as to indicate much pressure. When he died a tumor was found in the right pre-frontal lobe as large as the one in Dr. Dercum's case. The impression it made upon Dr. Angell was that the only distinction between the two sides of the brain in prefrontal tumors, is that the symptoms will be more marked when the growth is in the left hemisphere.

Dr. Hugh T. Patrick inquired as to the sense of smell in these cases.

Dr. Herman H. Hoppe, of Cincinnati, said he wished briefly to refer to a symptom complex that obscured the diagnosis in a case in which there were absolutely no general symptoms of brain tumor. A tumor grew from the sella turcica and involved both orbital portions of the frontal lobes. The earliest manifestations were from the optic chiasm. The man went on with business after developing atrophy of the optic nerve causing progressive loss of sight; then he began to develop sluggishness of the pupils. In the subsequent history there was a pure simple dementia, so much so that the diagnosis of dementia paralytica was made, he having at no time any symptoms of brain tumor. The man died in an insane hospital and the autopsy revealed the location of the tumor in the frontal lobe. The second point is the subject of location. Dr. Hoppe had the same experience with a tumor that Dr. Dercum had. A frontal tumor was diagnosed as a cerebellar tumor, of which the symptoms were those of a general progressive mental involvement, such as Dr. Dercum described so carefully plus one or two atypical attacks of epileptic seizures, more like tonic spasms, and the cerebellar gait, viz, walking to one side. The tumor lay in the path of the fronto-pontile cerebellar tract, the symptoms were to be explained by involvement of this tract.

Dr. George W. Jacoby, of New York, said that he had had the benefit of seeing the case Dr. Dercum had reported, and after comparing it with a couple of others, which he had previously observed, and after analyzing the symptoms of the cases reported by others, it seemed to him that we could be very positive in the one statement, that there is no symptom or series of symptoms pathognomonic of pre-frontal tumors. The only manner in which a diagnosis can be made, is by the sequence in which the symptoms follow one upon the other. It is generally stated that the special characteristics of certain single symptoms, as for instance, the mental disorders or the ataxic gait, are indicative of pre-frontal tumors; thus it is stated that the psychic symptoms represent a dementia, with a joyous excitement, something of humorous folly in speech and action; that the frontal ataxia differs from cerebellar ataxia in the patient swaying from side to side, but not staggering.

His experience had been that none of these peculiarities is sufficiently marked to warrant a diagnosis in the individual cases, but that in order to make a diagnosis of prefrontal tumors, we must take the sequence in which the symptoms occur. First and early, the occurrence of mental symptoms, these then followed by other general symptoms of brain tumor, and these again followed by symptoms due to pressure, but which latter are the ones upon which only a localization can be based. These are the occurrence of aphasia, the involvement of the motor tract, and the corresponding disorder of the reflexes.

Dr. E. E. Southard, of Boston, said that he had found it profitable in some cases to examine histologically other parts of the brain than those directly involved in the tumor. He recalled a case of tumor of the frontal lobe¹ in which epilepsy did not exist, but in which there was a unilateral paralysis on the same side as the tumor and histological study of the precentral gyri showed that for some reason on the opposite side there was absence of Betz cells. He believed histological examinations by any simple method would show the stratigraphical conditions of the gyri, that are of importance in epilepsy, and that we cannot form any definite conclusion about epileptiform seizures until such study is made.

Dr. B. Sachs, of New York, said he would like to add a word to the discussion. There were two points of vital importance in regard to the question of operability. First, of all, the focal signs; in many instances they give no idea of the actual size of the tumor, which would materially affect the result of an operation. So much depends upon shock—the shock seems to be in direct proportion to the size of the tumor—plus hemorrhage, that one of the most essential points for determining the operability of a tumor is to try to decide whether the tumor is of a large size or not. The other points belong to all tumors. A great deal depends upon the character of the tumor, particularly as regards the development of the symptoms. It is a very different thing whether the brain substance is being invaded by a tubercle, a sarcoma, or whether it is being gradually invaded by a glioma, and some of the peculiarities in regard to tumor of the frontal lobe may be explained by the fact that many of these tumors have been slowly invading gliomata, whereas in cases in which the tumor was of a much more destructive nature the symptoms were more marked. The destructiveness of the tumor is in direct relation to the distinctness of the symptoms. Dr. Sachs referred to a patient who had presented during life absolutely nothing else but epileptiform seizures every three or four months for four or five years, who died suddenly from hemorrhage from a tumor which on post mortem examination proved to be a huge glioma involving the entire one hemisphere of the brain. We often lose sight of the fact that the brain tissue may accommodate itself readily to the slow invasion of a glioma.

Dr. D. I. Wolfstein, of Cincinnati, alluded to a case of his in which a provisional diagnosis of tumor of the frontal lobe was made. It was a case in which there were no localizing symptoms whatever, the only distinctly determinable symptom being a complete optic atrophy with complete loss of vision. The case had been seen by others previously, but at the time it was seen by him the only symptom was as above mentioned. There had been some headache, but it had never been very prominent; no vomiting. The family alluded to certain attacks which they could not definitely describe. These attacks were not at all Jacksonian, but were suspicious in this direction. In order to ascertain what might be the nature of these attacks the case was sent to a hospital and observed very carefully, but during four weeks of observation no epileptiform seizure could be made out. There was no mental disturbance whatever, patient being unusually clear and never abnormally somnolent. There was no Witzelsucht. Instead of any mental disturbance there was rather a condition of euphoria. Careful examination was made to detect any indication of cerebral ataxia, as described by Bruns and others, but none could be made out.

¹Ricksler and Southard, "A Complicated Case of Brain Tumor," *Am. Journ. Insanity*, LXIV, 4, April, 1908.

The necropsy showed an infiltrating tumor in the left frontal lobe. On the cortex it was prefrontal in the sense of the photographs shown here, but in the depths extended backward so as to impinge upon the pyramidal fibers, and pressed them backwards, but did not involve the capsule. It would seem that such pressure of a mild degree might produce attacks of slight severity, attacks of weakness on the opposite side of the body with swaying momentarily and yet not enough to be of a paretic nature, or to produce convulsive movements. The location of this tumor and the degree to which it extended backward inclined Dr. Wolfstein to agree with what Dr. Sachs had said about calling these tumors prefrontal.

A microscopic examination of the tumor has not yet been made.

Dr. Dercum, in closing, said that in the cases reported by him, smell had been preserved. In another case which he had reported to the association some years ago, the sense of smell had been lost. His experience as regards frontal ataxia is the same as that of Dr. Jacoby.

In regard to Dr. Sachs's remarks about the size of the tumor he was in entire accord with what Dr. Sachs said. The first two cases were round cell sarcomata, the third was an endothelioma, and sprang from the dura of the base. As regards the term prefrontal Dr. Dercum felt it was a justifiable term, provided we use it to mean that the tumor is in advance of the motor convolution.

Dr. Harvey Cushing, of Baltimore, read a paper entitled: "Oculo-motor Palsies due to Vascular Constriction in Cases of Brain Tumor."

Oculo-motor and particularly abducens palsies, more or less fluctuating in degree, often occur in cases of tumor and are included among false localizing signs. Various explanations have been offered for their occurrence. Contrary to the usual anatomical description, these nerves underlie the lateral branches of the basilar artery, which have a rubber band effect and so constrict the nerves as to block their transmission of impulses. The condition is most apt to accompany tumors of the posterior fossa.

Dr. John Jenks Thomas read a paper entitled: "Report of a Case of Resection of Dorsal Spinal Nerve Roots for Gastric Crises of Tabes." Symptomatology of gastric crises. Theories in regard to the causation. Medical treatment. Surgical treatment in the past. Foerster's operation. Previous cases. Report of case. (*To be published in this Journal.*)

DISCUSSION

Dr. John K. Mitchell of Philadelphia, asked how Dr. Thomas justified an unqualified diagnosis of locomotor ataxia with knee jerks still present. Dr. Mitchell added that he had seen a number of ataxia cases lately in which surgeons had operated for various conditions without recognizing what the patient's real disease was. In the last year he had seen one case in which gastroenterostomy was performed, two cases in which operation was done for appendicitis, and two in which gall stones were hunted for, in all instances the real abdominal trouble being tabetic crises. Presumably none of these surgeons examined the knee jerks and the eye reflexes before operating, and Dr. Mitchell said he was accumulating cases at present to have a go with the surgeons about it.

Dr. Philip Coombs Knapp, of Boston, said he must confess that theoretically he was somewhat skeptical about the value of operating for the gastric crises of tabes by dividing the posterior roots, because the nerve supply of the stomach is dependent very much more upon the vagus

than upon the sympathetic. The success of Dr. Thomas's case, however, has led him to ask Dr. Blake to operate on another case which was very similar to Dr. Thomas's. This was a man with a history of very probable syphilis ten years before. For five years he had suffered from attacks of epigastric pain and vomiting lasting for two to four weeks. At first these attacks came four or five times in a year. The last year they had been getting more and more frequent. He was admitted into Dr. Blake's service with a question whether he had gallstones or malignant disease. Dr. Blake, not being a Philadelphia surgeon, recognized that it was a case for the neurologist to be called in and so he asked Dr. Knapp to see it. The man had Argyll-Robertson pupils, which were unequal, and a band of hypesthesia from the fourth to the sixth rib, very slight for touch, somewhat greater for pain, a good knee jerk, no marked hypotonus, practically no other tabetic symptoms. In answer to the objection Dr. Mitchell raised to Dr. Thomas's diagnosis, Dr. Knapp said that in the last few years he had seen many cases of retained knee-jerk and even ankle-jerk with pretty clear tabetic symptoms of several years duration. The man had very severe and persistent pain, but comparatively little vomiting. After he was admitted to Dr. Knapp's service the Wassermann test proved positive. An attempt at lumbar puncture gave unsatisfactory results. The pain persisted. He happened to be in the same room with Dr. Thomas's patient and was for a time encouraged to have the operation done, but Dr. Thomas's patient had a little setback and he got somewhat frightened. He was transferred to the surgical service for operation, then he became alarmed again, and his crisis ceased, he demanded a discharge and was unwilling to undergo the operation. He was discharged from the hospital about March 23 or 24, and came back April 11 with a history that he had been free from pain two weeks and then the pains recurred. This last attack seemed somewhat more intermittent. Dr. Knapp obtained a supply of coryfin, it having been claimed by Weiss to have relieved gastric crises in 15 out of 16 cases. This gave temporary relief, but only for a few hours. The pain persisted very steadily until Thursday last, when 12 minims of coryfin were administered and the pain seemed to let up a little in the afternoon and he was transferred to Dr. Blake's service. In the early morning he demurred at operation, the pain came back Thursday afternoon so he was willing to have an operation done by Friday, and Dr. Blake divided the seventh, eighth, ninth, and tenth roots. That afternoon the patient collapsed and came near dying but the last report was that he was doing well. The day after the operation he complained of much pain, more of the girdle pain, and spoke somewhat of inability to move the left arm or leg, but while Dr. Knapp was talking with him he was able to move his left arm, and he also made some movement of the leg, and next day he was able to move them both. The man had been a persistent morphinist. He recovered perfectly well from the operation, and was free from pain for a fortnight, but since then he has had another crisis, very similar to those before the operation.

Dr. Harvey Cushing, of Baltimore, said that he was in entire accord with Dr. Mitchell's statement that surgeons are a bad lot—even in Baltimore. However, he would like to make a bargain with Dr. Mitchell, for he knows of several instances of the kind mentioned, of abdominal operations for tabetic pains, and he would agree to turn over for Dr. Mitchell's collection the list of these surgical errors if Dr. Mitchell would agree to give him in return the list of cases of brain tumors long treated for neurasthenia or gastric headaches.

A few days ago a woman who had had very persistent gastric crises with great pain, was transferred from Dr. Barker's wards to the surgical side for a laminectomy, which was unavoidably postponed. When seen yesterday she was absolutely free from pain, and though willing to undergo the operation Dr. Cushing was unwilling to carry it out, owing to the sudden and complete relief from pain. If she had been operated upon two or three days before there would have been a brilliant surgical result to report. Dr. Cushing does not think that too much weight should be placed on surgical reports of cases regarded as cured a month after the operation.

Dr. D. I. Wolfstein, of Cincinnati, alluded to a case of his where a section of the posterior roots was undertaken, and although not done for gastric crises he thought it pertinent to this discussion.

It was a case of very long standing and had been seen by a great many neurologists both abroad and in this country. It was a case in which there were very marked exaggerated knee jerks and exaggerated ankle jerks without much hypertonia. There was a marked myosis with very minute pupillar aperture. Dr. Wolfstein had never seen a case in which pain was so prominent an element. The pains at the time he saw the patient were not of the lancinating character and were quite uniformly localized in the thoracic regions on both sides. Patient appeared to be always in pain, always held his hand to his side, and walked bent to one side. Having read of Foerster's operation the case was referred to Dr. Harvey Cushing, who undertook an operation for the relief of pain by division of the posterior roots. About four roots on one side were divided, and on account of a very marked degree of board-like hardening found at the time of the operation, this was all that could be done. After a very severe post-operative period the patient recovered, but has shown no improvement as regards the pain. There is an area of anesthesia corresponding to the divided root areas, but no diminution of pain in these areas. Theoretically, it is hard to say how the peripheral pain can be relieved in these cases if our present ideas as to the involvement of the centrally coursing degenerated fibers are correct. Dr. Wolfstein is inclined to agree with Dr. J. K. Mitchell and others in being skeptical about the correctness of the diagnoses of tabes in cases such as this, with extreme myosis and markedly exaggerated knee and ankle reflexes, without bladder disturbance, and with such distinctly localized pains corresponding to root distribution. It was on the theory that this case was a luetic lepto-meningitis rather than tabes that operative interference was counseled.

Dr. Blake said, it is of course useless to draw deductions from a single operation performed only a few days ago, yet it would seem that there might be a place for this procedure in occasional cases of tabes. In spite of the severe character of the operation, and the loss of a very considerable amount of cerebrospinal fluid, surgical shock was moderate. In this patient, there was an immediate cessation of pain and vomiting, and he expressed himself on the following day, as feeling better than for some time previous. The wound subsequently healed by first intention, in spite of the presence of bed sores over the sacrum. It may be that a unilateral laminectomy will be found ultimately the operation of choice, though the removal of both laminae of four or five vertebrae does not seem to seriously injure the function of the spinal column.

In similar cases, if the patients were willing, he should certainly give the operation a trial.

Dr. Joseph Collins, of New York, thought in the discussion the association was liable to lose track of what they started out for, that is the feasibility and advisability of this operation. Dr. Collins stated that he was very much in favor of the operation in cases that are intractable, and he has tried it on three occasions and he will continue to advise it. Dr. Collins said he would take the opportunity to speak relative to what Dr. Mitchell questioned in reference to knee jerks in tabes. In 10 out of 100 cases of tabes the knee jerks and ankle jerks are present. He said if this statement were not accepted by the association then tabes must be re-defined. A case such as that recorded by Dr. Wolfstein he would not be willing to accept as tabes, unless he knew the state of the blood and of the cerebro-spinal fluid. So far as he understood this case, he regarded it as a case of localized leptomeningitis of syphilitic origin, and he believed that an examination of the lymphocytes would reveal such to be the correct diagnosis. He believed that such cases eventuated in tabes when the destruction of the posterior spinal columns and their constituent axones is brought about. He thought in such cases utterly rebellious to treatment the surgeon should be called in, and he should be urged to strip off the meninges.

Dr. F. X. Dercum, of Philadelphia, narrated a case which was to him at the time of great interest, referred by Dr. Osler many years ago, long before we had the examination of the cerebrospinal fluid and Wassermann test. The man had frightful suffering, apparently crises of tabes, the knee jerks were retained. There was no ankle clonus. There was no marked disturbance of sensation anywhere. He had markedly contracted pupils. He was a user of morphia. Dr. Dercum persuaded him to do without hypodermics a day, and at the end of forty-eight hours he had a good pupil which responded to light. In other respects the symptoms had varied somewhat. He had symptoms on examination of a gastric nature, and Dr. Dercum had Dr. Keen examine him, and he excised a small gastric ulcer and the man recovered. He then disappeared. We all meet with such distressing cases and Dr. Dercum believed that this operation promises something in an otherwise very serious affection.

Dr. Thomas, in closing, said that he was very sorry that Dr. Mitchell should have been disturbed by the patient having knee jerks. He agreed fully with Dr. Collins in saying we frequently make the diagnosis of tabes with retained knee jerks and ankle jerks. In this case the reflex of the pupils to light was absent, although retained on accommodation, and the man had marked hypotonicity, which Dr. Thomas thought was fully as important in the diagnosis of tabes as ataxia, and he felt fully justified in calling the case one of tabes. In reply to Dr. Collins's question Dr. Thomas tried the Noguchi test but not the Wassermann test, and it was positive for syphilis. He tried the serum test. The count of the cerebro-spinal fluid was not made. At operation there was a marked thickening of the pia, but this does not justify Dr. Collins's apparent assumption that tabes may be due to pial changes. While thickening of the pia is frequently even generally present in tabes, the changes of tabes are something more than sensory degeneration due to this. Though this theory has been advanced as an explanation of the pathology of this disease, it has not been at all generally accepted, and does not account at all for such cerebral, bulbar symptoms, as the Argyll-Robertson pupil, the ocular palsies, or the atrophy of the optic nerve, to mention no more.

In regard to Dr. Wolfstein's case, he would like to know a little more about the location of the pain. We know when it comes to resection of the sensory nerve roots for pain in certain cases—as those reported to this association by Dr. Knapp and Dr. Jacoby—the pain returns for some unexplained reason. That certainly should be considered in deciding upon this operation. Dr. Thomas agreed that this operation should be done only in the most severe and intractable cases, those where some danger to life existed.

(To be continued)

NEW YORK NEUROLOGICAL SOCIETY

May 10, 1910

The President, DR. J. RAMSAY HUNT, in the Chair

TUMOR OF THE HIPPOCAMPAL LOBE

By Ernest Sachs, M.D.

The patient was a married woman, 26 years old. She had no children and gave a luetic history. Two years ago she began to suffer from headaches and vomiting, and for the past two or three months there had been dimness of vision. For a few weeks prior to coming under the speaker's observation she had subjective aure of smell; these odors were always pleasant, and were of foods of various sorts.

When the patient was admitted to the Beth Israel Hospital, in the service of Dr. J. E. Reinthaler, the following symptoms were observed: Cranial nerves: The first, as indicated by complete loss of smell on the right side; weakness of ocular muscles supplied by third and fourth nerves, and complete paralysis of the external rectus; the fifth, with marked hyperesthesia of the trigeminus, including the cornea. No other cranial nerves were involved. The reflexes were equal on both sides in both upper and lower extremities; none were exaggerated; no clonus nor Babinski. There was marked choked disc in both eyes. There was exudate over both optic nerves, with contraction of the object and color fields, and interlacing of the latter in the right eye.

The patient gave a fairly definite specific history, but in spite of that fact, on account of the marked double choked disc, Dr. Sachs advised an immediate decompression operation in order to save the eyesight. The patient, however, refused her consent to operation, and she was accordingly put on injections of bichloride. After three or four injections, there was marked improvement in some of her symptoms; the headache and vomiting disappeared, and her ocular palsies improved, the fifth nerve showing marked improvement within two or three days. The hyperesthesia also disappeared, but the condition of the eyes grew worse, the exudate and histological changes becoming more pronounced. The hyperesthesia of the fifth nerve gradually changed to partial anesthesia, with complete anesthesia of the cornea.

When the patient was re-admitted to Dr. Sachs's service, the symptoms indicated a sudden increase of intracranial pressure. There was

again intense headache, with vomiting, sighing respiration and yawning, and subjective auræ of taste. All these symptoms made it clear that there was a process in the right middle fossa involving the hippocampal lobe. Without further delay, a decompression operation was done by Dr. Sachs, as described by Cushing, the opening being made over the right temporal lobe. As soon as the dura was exposed, there were evidences of marked intracranial pressure; the temporal lobe protruded through the opening, and showed all the signs of inflammation. There were fine adhesions, and the cortex had the yellowish tint which the speaker said he had noted in other cases and had regarded as specific, rather than due to the presence of a neoplasm. The patient reacted well from the operation. The day following the operation the vomiting and sighing respiration had ceased, and the patient was very comfortable.

A CASE OF SPEECH INHIBITION

By E. W. Scripture, M.D.

The patient was a girl, 16 years old, who came to the Vanderbilt Clinic complaining of what she regarded as stuttering. The peculiar feature of the case was that when the girl was asked a question, she hesitated, turned her head to one side, and stuttered more or less before she began to speak. Something, apparently, inhibited thought, and it seemed to be more of a thought stutter than anything else. It was apparently closely related to the various forms of hysterical inhibition of speech. It was first noticed, according to the history given by the girl, about nine months ago, after a period of excessive fatigue. It was not associated with adenoids or nasal trouble, although the voice had a slightly nasal quality. The girl seemed to be bright mentally.

Dr. L. Pierce Clark said the conditions shown in this case reminded one closely of that type of hysterical abulia described by Janet. There was a lack of "will to will," giving us a latent period in the thought mechanism. The defect here seemed a psychic analogue to those seen in the motor disorder of Thomsen's disease. The trend of opinion regarding the latter affection was that the primary disorder was psychic; a volition defect, and not a muscular one.

Dr. B. Sachs said he had seen a number of examples of this peculiar disorder of speech; in fact, it did not strike him as being so very rare. It appealed to him as a difficulty in starting the mechanism of speech rather than a difficulty in the purely psychic part of speech. There was apparently some delay in the innervation of the vocal muscles. The cases he had seen were in boys and girls younger than this patient, and the defect had developed on a purely emotional basis. There were also cases that were related to some of the tics, and he distinctly recalled the case of a young boy who when he was asked a question would snap his finger and nod his head before he answered. This was a habit that he had apparently acquired. There were also cases of chorea that developed some difficulty in speech; in that disorder there was often a hesitancy in answering, and the speech was of a more or less explosive character.

Dr. J. F. Terriberly said that as this case developed about the time of the evolution of the menstrual function, he was inclined to regard it as an expression of the mental astigmatism not infrequently observed at this

period of life of budding womanhood. The hesitation or delay in replying to questions was in itself, in his opinion, not evidence of abnormal mentality, as this was not infrequently observed in people entirely sound mentally. He knew a family all the members of which were very tardy in this respect, but entirely sane and wholesome mentally. The speech defects of chorea were not in any respect of psychic origin, being caused entirely by the incoördinate action of the muscles of speech.

Dr. William M. Leszynsky thought the peculiarity of speech in the case shown by Dr. Scripture was perhaps due to slowness of comprehension and deafness. He inquired whether the patient's mental reactions had been studied.

Dr. Scripture, in reply to a question, said there was no history of any shock in this case. The patient's reactions were normal, and she responded to stimuli. In regard to the treatment of the case, he had found that the patient was readily put in the hypnotic state, and she had improved slightly under that method.

DIVISION OF THE SEVENTH SENSORY NERVE FOR ACUTE OTALGIC NEURALGIA

By Alfred S. Taylor, M.D.

This patient, who had already been shown at a previous meeting of the society, was again presented in order to demonstrate the degree of improvement that had occurred since. The patient was a young woman who was suffering from an intractable form of otalgic neuralgia, associated with a herpetic outbreak, the case being similar to those described by Dr. J. Ramsay Hunt. The patient was operated on by Dr. Taylor on April 23, 1909, both the motor and sensory branches of the seventh nerve being divided. This gave immediate relief, so far as the pain was concerned, but produced a complete facial paralysis. There had been a gradual restoration of power, however, in the paralyzed muscles, and this improvement had been especially rapid during the past two or three months. There had been no return of the pain since the operation.

Dr. L. Pierce Clark, whose case this illustrative geniculate neuralgia was, said that although Dr. Taylor's manipulation of the cerebellum had been the most considerate and gentle, there followed nevertheless some cerebellar incoordination which persisted for several months. Fortunately, this disorder in locomotion had now been entirely absent for six months.

The president, Dr. J. Ramsay Hunt, said that in connection with this patient he wished to call attention to the absence of any facial twitching or spasm, which he regarded as of especial interest and importance. This patient had had a complete facial palsy following division of the seventh nerve, the division including its sensory branch, or the pars intermedia of Wrisberg. Since the operation there has been a gradual and now a very considerable return of power in the left side of the face, so that the eyelid could be closed and the corner of the mouth drawn to one side, and yet there was an absence of the contractural condition and twitching which were so common and often so distressing in the peripheral types of cases when the facial was involved in the aqueduct of Fallopius. The speaker said he had often noted that in cases where the face was completely paralyzed—where one could assume that the nerve had been com-

pletely involved—the facial twitchings and contractures were absent, but when there was a return of power, these contractures and twitchings always developed unless the case was mild and the recovery from the palsy was complete.

In this case, Dr. Hunt said, the sensory root had been divided, which would naturally prevent the flow of irritating stimuli to the facial nucleus along its sensory pathway, and which excited the nucleus, with consequent discharges, manifested as facial spasms. The speaker suggested that in very severe cases the convulsive movements of the face might be favorably influenced by division of the sensory root. Also, in cases of spasmus facialis due to an irritation of the sensory system of the seventh nerve, a procedure might be devised which would block the flow of irritative afferent stimuli to the facial nucleus and relieve the condition of nuclear irritability.

The speaker said he had also observed that in cases in which the facial nerve or some of its branches had been divided on the face, twitchings and spasms did not develop, the lesion in this situation leaving the sensory mechanism of the seventh untouched, so that in this group of cases the nucleus would not be excited by irritative afferent stimuli.

In some cases of facial spasms other sensory systems undoubtedly convey irritative sensory impulses to the facial nucleus, notably that of the fifth nerve, but also of the ninth and tenth nerves which terminate near the facial nucleus in the brain stem.

The relationship of the geniculate ganglion and its system is, however, a more direct route to the nucleus than any other and has heretofore been entirely overlooked in the etiology of facial spasms.

Dr. Clark said that with the restoration of power in the muscles of the face in this case, he too had been on the lookout for these spasmodic movements referred to by Dr. Hunt, and the patient had mentioned to him that at odd times she had noticed a twitching under the eye. Further questioning, however, had elicited the fact that she had been using her eyes very considerably in fine sewing, and that by resting them the twitching had disappeared. The suggestion was made by Dr. Hunt, namely, that severe spasmodic movements of the face might be checked by division of the sensory root of the seventh nerve, was quite in line with what we knew about spastic conditions in other parts of the body, and the speaker thought this very important suggestion was worthy of careful consideration in all true facial spasm.

SPASTIC DIPLEGIAS AND HEMIPLEGIAS AFTER DORSAL ROOT SECTION

By L. Pierce Clark, M.D., and Alfred S. Taylor, M.D.

Case I was a boy who had already been shown at a meeting of the Society in October, 1909. The case was originally one of cerebral diplegia, with increased knee jerks, Babinski and the typical "scissors" gait. Dr. Taylor divided the last dorsal and all of the lumbar roots. Since then the patient had received regular physical training to correct the incoordinate movements which remained in these cases after operation, and which were no doubt remnants of the former vicious excessive reflex action perpetuated through mental, conscious or unconscious association.

These exercises, which were given by a competent teacher, consisted of lying down, resistive hip flexion, passive stretching of the hip extensors, resistive hip abduction, etc. Under this system of training, the boy had made considerable definite progress. He was now able to walk with head and trunk erect, keeping his arms by his side. He walked with a narrower base than formerly, although the side swaying continued. His gait was much better when walking slowly than when his pace was quickened. The patient's self confidence had greatly increased, and his ambition was aroused.

Case II was that of a boy, 18 years old, whose right side had been paralyzed from birth. The case was one of infantile cerebral hemiplegia. He had had epilepsy since he was eight months old. At first the attacks were truly hemiplegic, beginning in the arm of the affected side. The whole body was affected. The right arm was spastic in the shoulder, arm, forearm and hand. Permanent contraction of the abductors of the arm, biceps and long flexors of the fingers were present. The shoulder and arm were the seat of a mild grade of athetotic movement.

An operation was done on November 15, 1909, by Dr. Taylor to overcome the spastic state, and to note the influence of such operations upon the epilepsy and the athetosis. Spinal hemilaminectomy was done, the dorsal nerve roots from the fourth to the seventh, inclusive, being resected. No specific anesthesia followed the operation. All spasticity was removed, but the athetotic movements were worse for ten days after the operation; then they disappeared entirely, and they were still absent in large part. As to the effect of the operation on his epilepsy, there was a record of 41 fits in 1907, and 51 fits in 1908. In 1909, up to the date of the operation in November, he had had 160 attacks; since then he had had but 36 attacks, the number having been reduced from fifteen per month to six per month without the aid of bromides. The violent, explosive laughter to which the patient had formerly frequently given way had also been modified in character. The patient was under physical training and orthopedic care for the contractures of the arm.

Case III was that of a boy, 18 years old, who was a typical example of an infantile hemiplegic. The left arm and leg were moderately undeveloped, the left forearm was contracted on the arm at an acute angle, and the hand was flexed at more than a right angle at the wrist. The fingers were in extension, and could just be moved. The patient was feeble minded.

Dr. Taylor resected the dorsal nerve roots from the fourth to the seventh, inclusive, on November 8, 1909. As soon as the patient had recovered sufficiently from the ether narcosis to obtain the normal reflexes on the non-paralyzed side, it was found that all the reflexes were intact in the left upper extremity. Further examination showed anesthesia in the lower two thirds of the whole length of the arm. The arm was entirely free from spasticity, and if the extremity were free from its permanent contraction, it would undoubtedly assume its natural and normal position. Under physical training and orthopedic appliances the limb had improved; the patient was now able to move the fingers, although the muscles had lost all power of contraction.

Dr. Alfred S. Taylor, who had done the operation in the cases shown by Dr. Clark, said that the most interesting feature from a surgical standpoint was the freedom from injury or deformity of the spinal column as the result of the unilateral laminectomy. The spinal column showed no

lack of flexibility, either antero-posteriorly or laterally. Dr. Taylor said that as the result of his experience, he was convinced that it was not necessary to divide all of the posterior roots in order to relieve the spasticity: on the contrary, as had been pointed out by Dr. Joseph Fraenkel, only a part of the sensory roots had to be divided, and by doing this we relieved the spasticity without the danger of producing ataxia or trophic disturbances.

Dr. B. Sachs said that in the operative treatment of these spastic conditions, he was unaware of the fact that any one had advocated complete division of all of the posterior roots, and he thought the general conclusion was that only alternate roots were to be divided: otherwise, he believed that serious sensory disturbances might follow. The plan of cutting only part of each root might lead to equally satisfactory results. So far as the results of dorsal root section in the cases of spastic diplegias and hemiplegias shown by Drs. Clark and Taylor were concerned, Dr. Sachs thought they were only fairly satisfactory, and he had seen many crossed-leg boys whose walk was not very much worse than the cases shown tonight. The operation was still in its infancy, and it would be wise to make haste slowly and study results. He would expect the best results from the operation in the cases where there was only moderate deformity. In two of the cases shown tonight, where the condition was congenital, it was almost out of the question to expect to see much improvement.

Dr. Sachs said that in old hemiplegics, with contracture of the arm, he did not see why it would not be available to do a posterior root section in the cervico-dorsal region. He had advised this procedure in one case, but the patient had refused his consent.

Dr. Charles E. Atwood, who had seen these cases in Dr. Clark's and his service prior to operation, said he could testify to the fact that there was a very marked improvement in all of them. Not only were the patients improved physically, but they were in better spirits and mentally brighter and seemed anxious to show how much they could really do. As to the operation itself, as Dr. Taylor performed it it was simple but not easy, and was almost bloodless.

Dr. Clark, in closing, replying to Dr. Sachs's suggestion that posterior root section in the cervico-dorsal region might be advisable in old hemiplegics, said he had three or four such cases in mind, but the patients refused to give their consent. Furthermore, there were usually contraindications in these old patients in the way of heart or kidney lesions.

SPECIFIC SPASTIC PARAPLEGIA, WITH DIVISION OF POSTERIOR ROOTS

By Ernest Sachs, M.D.

The patient was a man, 32 years old, suffering from a long-standing hemiplegia which had left the right leg rigid and spastic. Dr. Sachs did a unilateral laminectomy and divided the third and fourth lumbar and the first sacral posterior roots. Following the operation the patient had complete paralysis, with loss of reflexes, but there was a gradual return of power after ten days. In this case, the speaker said, he practically did the operation that had been described by Dr. Taylor, but divided the roots

at their exits. Following the advice of Foerster, he did not divide three successive roots, fearing the production of anesthesia. Upon the completion of the operation he did not close the dura, nor was it essential to do so. In the selection of these cases for operation, it was important, as Foerster had pointed out, that we should distinguish between the paralytic and the non-paralytic cases. He had recently done the operation on a boy with Little's disease who had no paralysis, and those cases were more favorable than the ones that were paralytic, as was this man.

Dr. S. P. Goodhart said that in the case of young children, a sufficient exposure of the parts could not always be obtained by unilateral laminectomy. This fact had been brought to his attention in a case which was operated on by Dr. John J. Morehead at the Red Cross Hospital. The patient was a boy, five years old, and the difficulties connected with the unilateral laminectomy were so great that the operator gave up that plan and made the usual incision.

Dr. J. F. Terriberry said he understood the object of this operation was to lessen or curtail the delivery of sensory impressions to the cord. In one of the cases shown by Dr. Clark there was no change in the patient's skin perceptions nor evidence of change in the deep or protopathic sensibilities after the operation: the improvement in this case, therefore, if it had occurred, must be attributed to some other cause.

Dr. Terriberry said he had seen a good many of these cases treated by tenotomies and fixation for six months or longer where the results were better than in the cases shown at this meeting. He did not wish to be understood, however, as protesting against this operation if other methods of treatment, thoroughly carried out, had failed. The operation was still in the experimental stage, and should be so considered. Its merits, if any, would appear some years hence.

Dr. Clark, replying to Dr. Terriberry's statement regarding the good results obtained in cases of this kind by orthopedic measures, said that when these patients were shown at a meeting of the Pediatric Section of the Academy of Medicine last November, Dr. Gibney, who was present at that meeting, said the results were better than could be obtained by orthopedic means. As to the loss of sensation following the operation, the fact should be borne in mind that there were other sensory routes than those that travelled through the skin. In one of these cases there was a loss in the muscular perception sense, and the sensory impressions entered through the muscle spindles rather than from the skin. We should not lose sight of the fact that the spastic condition was a protective feature against the paretic state. The question was, how could we lessen the spasticity without producing the paretic condition? In conclusion, Dr. Clark said the operation might be of service in some cases of myelitis where the lesion was a diffuse one and not a purely pyramidal one.

Dr. Taylor said that in one of the cases in which the result had been criticised, only an incomplete operation had been done. That boy still had about four-fifths of his spastic muscles untouched by the operative procedure, and it was not fair to hold that case up as an example of an operation which was still on trial. As to whether one should choose to divide the entire posterior roots of selected nerves, or a definite portion of each sensory root, that was largely a matter of choice. The object in view was to cause a certain amount of degenerative lesion in the sensory tracts of the cord, and it did not make much difference how it was distributed.

A CASE OF SPASTIC PARAPLEGIA FOLLOWING CEREBRAL INJURY: INTRASPINAL NEURECTOMY OF POSTERIOR ROOTS FOR RELIEF OF SPASTICITY

By A. S. Taylor, M.D., and Christopher C. Beling, M.D.

The patient was a boy, 19 years old, who was admitted to St. Michael's Hospital, Newark, on July 1, 1909, with a history of having been accidentally shot in the right eye. On admission he was unconscious and had general convulsive movements occurring every fifteen minutes and lasting from five to fifteen seconds. Two days after admission the right eyeball was enucleated. At this time he had a left hemiplegia, the paralysis being complete in the left leg, fairly well marked in the left arm, and but slightly present in the face. Convulsive movements were noted on the right side at intervals of fifteen or twenty minutes, and about thirty seconds in duration. On July 5 these movements ceased. The patient gradually regained the use of the arm and face, but the inability to use the left leg persisted. He had but slight use of the right leg. His mental condition was good. On August 31, 1909, an x-ray picture was taken by Dr. C. F. Baker, which revealed the presence of the bullet over the motor area of the right leg. On September 9, 1909, the patient walked without assistance, and at the end of the month he was discharged from the hospital. On November 9, following, he came to the Neurological Clinic of the hospital presenting a spasticity of the lower extremities: the left was markedly stiff; the right but slightly. The patellar and Achilles reflexes were exaggerated, and double ankle clonus, Babinski and Oppenheim reflexes were present. The optic disc and pupil were normal; no sensory disturbances were noted.

On November 22, 1909, on the advice of Dr. M. Allen Starr, an unsuccessful attempt was made to remove the bullet, the failure being due to the fact that the radiographs taken three months before were not accurate guides for localization. The patient recovered from this operation, but as he was gradually growing more helpless and spastic, an intraspinal neurectomy was done by Dr. Taylor on April 20, 1910. The cord was exposed by a right unilateral laminectomy, and from thirty to fifty per cent. of each posterior root, from the last dorsal to the fifth lumbar, was divided on both sides. Immediately following the operation, the spasticity improved considerably. Babinski was slightly present, on both sides, and the clonus vibrations dropped from 240 to 160 per minute. Owing to the contracture, the right leg could only be extended to an angle of 110 degrees at the knee joint, and the left leg a little over 80 degrees while the patient was under the influence of the anesthetic. On April 21, excepting for the contracture, the muscles were free from spasticity. The left foot was flaccid, with slight inversion. All forms of sensibility were intact. The knee jerks could not be elicited, there was no ankle clonus, and all the reflexes were absent on both sides. Dr. Beling said that a further report of this case would be submitted to the Neurological Society at a later meeting.

A CASE OF ACUTE POLIOMYELITIS POSTERIOR OF THE
RIGHT SEVENTH NERVE, WITH BELL'S PALSY AND
DEFECTS OF HEARING, TASTE AND SMELL

By J. F. Terriberry, M.D.

The patient was a schoolboy, 16 years old, a native of the United States. His family history was unimportant. With the exception of measles and diphtheria which he had had previous to his fifth year, his health had been good, although it was said he was never a vigorous boy, either physically or mentally. Although not distinctly rheumatic, he stated that following rather active physical exertion his muscles were often sore and painful for a few days. For the past three or four weeks he had been troubled at times with headache, the pain beginning in the morning in the left brow, then becoming general and passing off as the day wore on, without the use of medicine. He said the pain recurred on alternate days, at times, but at no time had he had accompanying symptoms clearly indicating malarial infection. He had been free from this pain since his present illness began.

Eight days ago, upon awakening at six o'clock in the morning, having retired quite well and after a good night's sleep, he was unable to move the right side of his face, and the conchal region of the ear was much swollen and very painful and tender when touched. There was less pain and no swelling over the remainder of the ear, the mastoid region immediately behind the ear, and for a little distance below and in front of the ear. He had no fever, and his condition was otherwise good. His symptoms remained practically unchanged for a period of four days, when an herpetic spot appeared on the antitragus, followed within a week by three similar spots located at the termination of the helix, in the center of the concha and at the margin of the auditory canal, all within the hollow of the concha. The swelling and tenderness subsided shortly after the appearance of the last herpetic spot, and his condition, when Dr. Terriberry first saw him, was as follows:

The boy was somewhat anemic in appearance, but stated that his general health was about as usual. He had a complete paralysis of the right side of the face, the tongue was protruded normally and the muscles of the pharynx were perfectly balanced at rest and in action. The ear was congested and somewhat swollen in the conchal region, and the four herpetic lesions were waning. The right side of the face was of a dusky, red hue, contrasting sharply with the sallow color of the opposite side: it was hot to the feel, and the surface temperature was 96° F., as contrasted with 95½° on the left side. The skin vessels were markedly paretic. There was hyperesthesia of the conchal region of the ear; in other respects the skin perceptions were normal. The same was true of the mucous membrane of the pharynx and mouth. Firm pressure behind the ear and grasping the upper ear between the thumb and finger caused pain. The cheek, when grasped with the finger in the mouth, was painful. The alterations in sensibility excepting in the conchal region, were apparently subcutaneous and probably muscular.

With respect to the patient's hearing, the watch was heard at eight inches with the right, and at three feet with the left ear, these findings being uniform after many tests. There was absence of tinnitus, vertigo

or other subjective phenomena of auditory irritation. Bone conduction was equal on the two sides.

Repeated tests of taste perception showed its absence to salt and quinine on the right half anterior portion of the tongue, and prompt and accurate on the left side. Passing a probe wound with cotton over the tongue caused a feeling of tickling on the right side, with a sharply defined boundary at the center: this test was repeated a number of times with the same result.

With regard to olfactory perception, the patient failed to recognize the oil of cloves on the right side at the first examination, but when examined four days later he had recovered this sense, the disability probably being mechanical. There was no evidence, general nor local, of involvement of the pneumogastric nerve.

A second examination made four days later showed a marked improvement in his condition: he had quite recovered the perception of smell, his taste had become normal or nearly so, and there was decided improvement in the hypoacusis. He could hear the watch tick at thirteen inches. The facial palsy, however, remained unchanged: it was complete, and there was no response to the faradic current in nerve nor muscle. The dusky appearance had left the face, which was still slightly red and perceptibly warmer to the touch than the opposite side. The vasoparesis was much less decided, and the vesicles in the concha were disappearing.

This case was of interest, Dr. Terriberry said, in that it contributed some definite data upon the question of the sensory-trophic field of the seventh nerve. Although the effects of the storm were rather wide-spread, they disappeared or improved so rapidly, with the exception of the seventh nerve, as to warrant the conclusion that the sensory-trophic phenomena were due to injury to this nerve.

Dr. J. Ramsay Hunt said he would regard this as a typical case of posterior myelitis of the geniculate ganglion. The eruption was situated within the zoster zone of the geniculate, and the facial palsy was due to an extension of the inflammatory process to the fibres of the seventh nerve. The speaker said that in addition to this group of cases, he had also isolated other groups in which the lesion was referred to the glossopharyngeal and vagal and auditory ganglia. He had also attempted a differentiation of the zoster zones of the geniculate, glossopharyngeal and pneumogastric ganglia on the external ear and within the buccal cavity (*Archives of Internal Medicine*, June, 1910).

The auditory complications in cases such as Dr. Terriberry had demonstrated were due either to primary involvement of the root ganglia of the auditory nerve (ganglion of Scarpa and ganglion of Corti), or to involvement by contiguity from the inflamed geniculate ganglion.

THE WASSERMANN REACTION IN IDIOCY: A PRELIMINARY CLINICAL REPORT

By Charles E. Atwood, M.D.

The speaker said that among idiots it was impossible to gain the slightest clue, in most cases, from appearances, symptoms or history, as to the presence of syphilis. Statistics, therefore, based on these data alone, were unsatisfactory, and varied greatly with different observers. The

Wassermann and Noguchi tests, made under certain conditions, were reliable, and were destined to aid materially in ascertaining the actual role which syphilis played in the production of idiocy.

Two hundred and four cases of low-grade idiocy from the writer's service in the New York Children's Hospital and Schools were carefully studied and classified clinically. Specimens of their blood were examined by the Wassermann-Noguchi tests at the Rockefeller Institute by Dr. Noguchi himself or under his direction. A record was kept of each case and percentages calculated for the various clinical forms of idiocy. The percentage found for the total number of cases studied was 14.7. The percentage for so-called idiopathic cases was about 10 per cent.; that for diplegics was over 23 per cent. Three microcephalic cases out of six (50 per cent.) showed a positive sero-reaction. Two idiots with cerebellar ataxia gave a positive reaction. A myxedematous idiot, a case of amaurotic family idiocy and two cretins showed negative reactions.

The writer made several interesting deductions from his study. The large percentage of positive sero-reactions in idiots with grave organic lesions superadded to those common to the disease, as in diplegic cases, would seem to point to other etiological factors for these conditions than simply trauma and asphyxia. Possibly, an imperfect development of the vascular system or other syphilitic process might be such a causative factor.

Cases of idiocy should have a serum test for syphilis before mercurial or iodide treatment was instituted, as the indiscriminate use of these powerful remedies, without a definite object, was harmful to the non-syphilitic on account of the conditions of malnutrition.

Dr. Clark said he saw many of the patients upon whom these tests had been made by Dr. Atwood, and he thought it possible that hereditary syphilis played quite an important role in the imperfect physical and mental development of these patients. It was possible that lues played a more important part in the production of diplegia than had hitherto been attributed to it. As a matter of fact, we knew that hereditary syphilis greatly prevented the proper development of the cerebral blood vessels, thus rendering them more vulnerable to rupture through physical trauma or prolonged asphyxia at parturition.

Periscope

Monatsschrift für Psychiatrie und Neurologie

(Vol. 27. 1910. No. 1)

1. Psychoses following Trauma. A. L. BUCHHOLZ.
2. Two cases Combination of Cerebral Gummatous Syphilis with General Paresis. E. STRAUSSLER.
3. Double Softening of Supramarginal Gyrus. K. SCHAFER.

1. *Psychoses Following Trauma*.—Buchholz describes at great length the clinical course and anatomical findings in a case of progressive mental deterioration and fatal termination following a trauma to the head. The injury occurred in 1900, death in 1909. There were a number of features of general paralysis during the course and the brain showed some pial thickening and infiltration of pia and vessel sheaths with lymphoid and plasma cells. The argument is brought forward that these changes were less marked than in general paralysis, although it is known that in cases of long duration these inflammatory changes are often slight. The very labored distinctions drawn between the picture shown by this case and that of what one would expect if it were one of general paralysis are almost wasted when one finds that the details of the trauma are meagre, that no spinal puncture was done and no Wassermann (although the patient did not die until March, 1909) and that there was a history of probable chancre of the rectum 18 years prior to the onset. The author inclines to the opinion that the case might be general paralysis but that the trauma should be reckoned with in the etiology. He believes that all cases of general paralysis have had syphilis but that other things may be determining factors, *e. g.*, trauma.

2. *Cerebral Gummatous Lesions with Progressive Paralysis*. "*Lesions Cerebri Diffusa*" and "*Lytic Encephalitis*."—Case I was typically one of general paralysis. There was nothing peculiar in the clinical picture to indicate that it was different from other cases of that disease. There was a syphilitic history and Wassermann reaction was positive in serum and spinal fluid. Anatomically also the findings were characteristic of the general paralytic process. In addition, however, there were numerous miliary gummata strewn through the cortex of the frontal and temporal lobes and of the motor area. These gummata were in relationship to the smaller vessels but entirely independent of the meninges.

Case II was a man of 48 with disturbance of gait and diffuse mental disorder for three years, then a third nerve paralysis. Syphilis was admitted. Wassermann reaction was positive in both serum and spinal fluid. Death followed. The brain showed the usual changes of general paralysis. In addition there was a large gumma of the mid-brain and several smaller ones in the neighborhood. Unlike the previous case these gummata were not associated with the vessels.

The author gives a valuable review of the subject of the interrelationship of syphilis and general paralysis and arrives at the conclusion that

the term "diffuse cerebral syphilis" should be dropped—that there is insufficient evidence of the existence of such a process. He insists with Alzheimer on a sharp distinction between syphilitic and meta-syphilitic processes in the brain but holds that only specific gummatous processes should be regarded as syphilitic.

3. *Double Sided Softening of the Gyrus Supramarginalis*.—A valuable contribution to the anatomy of this part of the cerebrum and its connections. The patient, a woman of 45, after two apoplectic attacks, occurring six months apart, the first affecting the right side, the second the left side, presented the following symptoms: motility slightly impaired and beginning contractures in left arm, otherwise no motor disturbance; on both sides sensibility to pain lost, pin-pricks felt only when attention was fixed on them; great disturbance of localization, sense of position, thermic sense and pressure sense; complete astereognosis. Death occurred after three years and softenings were found in both hemispheres. That on the right involved the lower two thirds of the posterior central gyrus and a part of the gyrus supramarginalis; that on the left practically destroyed the whole gyrus supramarginalis without affecting the neighboring parts. Photographs of a Weigert series are given showing on the right side a retrolenticular degeneration in the region claimed by von Monakow to be occupied by a tract connecting the ventral nucleus of the thalamus with the gyrus supramarginalis. The author takes exception to von Monakow in that the degeneration showed this path to be a cortico-fugal rather than a cortico-petal one. Further the fact that this degeneration occurred only in the right side where the posterior central as well as the gyrus supramarginalis were affected and not on the left where the latter alone was involved, shows that the tract is from the posterior central and no similar fibres come from the gyrus supramarginalis. Still further the secondary degeneration in the optic thalamus was not in the ventral nucleus but in the postero-lateral. The author concludes that the gyrus supramarginalis is concerned with muscle sense, localization and stereognosis; that it is not connected with the thalamus but constitutes a memory or conception field for cerebral sensibility; that two varieties of cortical sensory disturbance may be designated, (*a*) pure loss of sensation such as permanent anesthesia of the skin, (*b*) association defect of superficial and deep sensibility which may be called topoanesthesia and stereognosis.

J. W. MOORE (Central Islip).

Revue Neurologique

(Vol. XVII, No. 18)

1. Pathogenesis of Tabetic Arthropathies—A clinical anatomical study of two cases. ALFRED GORDON.
2. Sympathetic Optic Atrophy. PÉCHIN.
3. Two Cases of the Syndrome of Basedow Treated by Adrenalin. Consideration of the Relation Between the Thyroid Body and the Suprarenal Capsules. GOLDSTEIN.

1. *Pathogenesis of Tabetic Arthropathy*.—The origin of arthropathies during the course of tabes dorsalis rests principally on the involvement of the nerves but traumatism is the exciting cause.

2. *Sympathetic Optic Atrophy*.—Following an injury or disease in one eye an optic atrophy may occur in the other eye. It may come on in two months after the accident and without other cause. Two cases of this are reported. They are of great nosologic and medico-legal interest.

3. *Treatment of Basedow's Syndrome by Adrenalin*.—In two cases the symptoms were made worse by this treatment and the author concludes that there is no adrenal insufficiency in exophthalmic goitre and in consequence the treatment by adrenalin is not indicated in the syndrome.

(Vol. XVII. No. 19)

1. Cyst of the Cerebellum. ROUX.

2. Reflections on two Cases of Hysterical Hemianesthesia, one with Paramyoclonus. LAFFORGUE.

1. *Cyst of the Cerebellum*.—The symptoms of a brain tumor developed suddenly—headache, vomiting, choked disc and slow pulse. There was titubation, stiffness in the neck and muscular hypotonia. There was no history of traumatism or otitis media and lumbar puncture gave normal cerebro-spinal fluid. An operation over the left lobe of the cerebellum showed nothing abnormal. After the operation the signs of increased intracranial pressure decreased but the gait was cerebellar-spastic and hypotonus was marked on the left side. There developed a distinct atrophy on the left side of the body and a hernia about the size of an egg at the site of the operation. A second operation a year later showed a number of cysts which destroyed the entire left lobe of the cerebellum. The wound healed rapidly. After this operation there was a nystagmus, some weakness in the left side of the face and difficulty in looking to the left. All the symptoms slowly improved. It is interesting that there was an absence of diadococinesia and that there was a decided atrophy. It is suggested that the cerebellum has a trophic influence.

2. *Hysterical Hemianesthesia*.—The first case was the common type of hysterical hemianesthesia, sensory-sensorial, but complicated with a myoclonus which also involved the face. The second case developed a hemianesthesia after remaining in the vicinity of the first case but in the second case the anesthesia did not involve the mucous membranes or special sense organs. Suggestion simple or complex, is the basis of hysterical manifestations. Hysterical patients should be isolated. The "incoherence" of these manifestations may be explained by the conflict of opposed suggestions.

(Vol. XVII. No. 20)

1. Gumma of the Pons in a Myxedematous, Amaurotic, Acromegalic Patient. Death from Pleurisy. BAUER and GY.

2. The Process of Myelination of the Spinal Cord in Triplets. GUINIO CATOLA.

1. *Gumma of the Pons*.—The patient died at the age of forty-two years. He had gonorrhea when seventeen years of age followed by suppurating sterno-clavicular arthritis; ten years later a chancre followed by blindness due to syphilitic choroid retinitis; alternating paralysis; right hemiplegia with paralysis of the left sixth nerve, caused by a gumma on the left side of the pons—myxedema due to sclerotic changes in the

thyroid body—acromegaly with pituitary hyperplasia—chronic nephritis with albuminuria. Death was due to pleurisy and at autopsy there was noted the presence of tubercles in the apices of the lungs and gummatous lesions in the adrenals.

2. *Myelinization in the Spinal Cord.*—In triplets myelinization is retarded.

(Vol. XVII. No. 21)

1. On the Nature of the Motor Disturbance from Affections of the Cerebellum—Tremors—Clonic Movements—Change in the Reaction of Equilibration—Asynergia. ANDRÉ-THOMAS and JUMENTIÉ.
2. Right Lateral Homonymous Hemianopsia—Loss of Sense of Orientation—Softening in the Left Occipital Lobe. GABRIEL BOUDET.

1. *Cerebellar Motor Disturbances.*—The case was diagnosed as probably primary atrophy of the cerebellum. The chief disturbances were exaggeration of voluntary movement ("dysmetria") differing from ataxia in the preservation of orientation of the limb and not being modified by the use of vision. This is one of the factors causing adiadicocinesia, the others being the slowness of the relaxation of the antagonistic muscles and a retardation between the voluntary excitation and the contraction. There is a "kinetic" tremor which is noticed when the patient executes a voluntary movement, usually at the beginning of the movement; and there is also a "static" tremor seen when the patient tries to maintain an attitude with the hand. The troubles in equilibration and the asynergia are due to the above factors.

2. *Right Lateral Homonymous Hemianopsia.*—The patient was a cabman in Paris who suddenly, but without loss of consciousness, lost all sense of orientation or memory for places. There was no defect in intelligence and no aphasia; he could read, write and calculate. There was some difficulty in remembering proper names, especially of places. The right homonymous hemianopsia did not include the fixation point. There was difficulty in naming colors, mauve called red, etc. Apparently matching colors was not tried. Autopsy showed a lesion in the occipital lobe destroying the cuneus and the lingual lobule; on the external surface, the first occipital convolution and eroding the second; and on the inferior surface, a part of the fusiform. The region destroyed was replaced by a large cavity connecting with the ventricle.

(Vol. XVII. No. 22)

1. Trephining for Cerebral Decompression, followed by Transitory Aphasia but Permanent Improvement, in a case of Cerebral Tumor. A. SOUQUES.
2. Symptom of Organic Central Paralysis of the Upper Limb. J. M. RAIMISTE.

1. *Cerebral Decompression.*—The patient complained, for three years, of severe paroxysmal headaches, without vomiting or nausea but sometimes accompanied by a paresis of the right leg. An examination at that time was negative but six months later there was intense optic neuritis and vision was reduced. The headaches had become more severe and there was occasionally vomiting. Lumbar puncture was negative and antisyphilitic treatment was without result. An opening was made over

the left hemisphere which appeared normal. Following the operation there was a right hemiplegia with aphasia. Within two weeks the mobility of the right side had returned although a Babinski reflex was still present on the right side, and speech was almost normal, only rarely a word used incorrectly. The headache and vomiting disappeared and vision was markedly improved.

2. *Sign of Central Organic Paralysis*.—The patient lies on his back and the arm by the side in pronation; the forearm and hand are then passively raised to the vertical position with the elbow resting on the bed; the palmar surface of the hand is then turned inward, the forearm and hand being supported in its vertical position by the examiner. If now the support is withdrawn from the hand and the patient's attention distracted it still maintains its vertical position if the member is not the seat of a central organic paralysis; but if it is, the hand falls to an angle of 130° – 145° . When the above procedure is carried out, the sign, falling of the hand, is not present in cadavers, examined shortly after death; or in deep narcosis; or when the arm is paralyzed by brachial plexus injury; or in hysterical paralysis. This "phenomenon of the hand" appears immediately after the onset of a hemiplegia, becomes less perfect when there is any return of voluntary motion and soon disappears. When the patient dies showing this phenomenon it persists on the affected side for five to thirty minutes after death.

(Vol. XVII. No. 23)

1. The Pathogenesis of the Argyll Robertson Sign. CHARLES LAFON.
2. The Simultaneous appearance of the Catatonic Syndrome and Epilepsy in the same patient. N. NOUET and L. TREPSAT.

1. *The Pathogenesis of the Argyll Robertson Sign*.—An argument in favor of the location of the lesion causing this sign in the ciliary ganglion.

2. *Catatonia and Epilepsy*.—The combination of the catatonic form of dementia præcox and epilepsy in the same patient is rare. The diagnosis presents some difficulties because the dementia may be mistaken for that due to epilepsy. The patient was twenty-three years old and showed the typical symptoms of the catatonic form of dementia præcox and in addition had attacks of epilepsy.

C. D. CAMP (Ann Arbor).

Book Reviews

DIE PSYCHOSE MAUPASSANTS. Ein kritischer Versuch. Von Dr. med. Wilhelm Lange, Tübingen. Johann Ambrosius Barth, Leipzig. 60 pf.

This is a reprint of Gaupp's Zentralblatt. Maupassant acquired syphilis, took narcotics for severe headaches, especially opium and cannabis, suffered from hallucinations and finally died of an atypical paresis. Several of his works bear the imprint of his psychosis.

These are the general conclusions of this short and interesting sketch.
BROWN.

UEBER DIE FUNCTIONEN VON HIRN UND RÜCKENMARK. Gesammelte Mitteilungen. Neue Folge. Von Hermann Munk, Ord. Hon.-Professor a. d. Universität Berlin. August Hirschwald, Berlin.

The author has here collected some 16 studies which have appeared in various scientific publications, thus giving them a more permanent form and at the same time offering an easier access to his teachings.

These are for the most part well known. The introductory paper is on the center for sight and ideas of space; then follow five contributions to the sensory areas of the cortex. These are followed by a critique of Goltz's studies on the dog without a cortex which can be read today with much interest, even though the author's teachings are not in thorough accord with later findings. Three papers on the extent of the sensory areas are then followed by comments on Hitzig's contributions to the physiology of the cortex. A short paper on motor loss as a result of sensory defect is of particular interest and the three final studies on the functions of the cerebellum close this interesting series of papers.

It would be highly desirable to have other collections of this type, as the contributions of leading investigators are apt to be so widely scattered as to be consulted with difficulty.

JELLIFFE.

NERVOUS AND MENTAL DISEASES. By Archibald Church, M.D., and Frederick Peterson, M.D. Sixth Edition. W. B. Saunders and Company, Philadelphia and London.

This new edition remains much the same as the fifth. Some 20 pages have been added, which include a few pages on psychasthenia and three quarters of a page on what is rather loosely called psychotherapy.

The book has proven useful and will continue to do so in this new edition.

BROWN.

LE RÉGIME DES ALIÉNÉS. By Dr. Fernand Dubief, with a preface by Dr. Bajanoff, professor of the University of Moscow. Paper. Pp. 347. Paris, Jules Roussel.

Dr. Dubief, who is also vice-president of the French Chamber of Deputies, has prepared the new insanity laws which are to replace those of 1838. The latter, the result of Pinel's revolutionizing work, have neces-

sarily become antiquated and among the new proposals are many safeguards for the insane which have long been accepted as a matter of course in America. However there are certain features which should attract attention, notably the proposition "to commit for a definite period, with the possibility of prolongation of the period of internment, of habitual drinkers"; the strong plea against capital punishment of criminals who may be suspected of insanity, and against the summary imprisonment of vagabonds—most of whom, Dubief repeats, are inferiors or epileptics whose proper place is in asylums, or persons physically disabled, who require treatment in hospitals. The proposal to appoint as chief of the medical staff of each division of an asylum, a salaried physician who does not reside at the institution, "so that he may not become isolated from medical progress," seems particularly desirable.

OBERNDORF.

DER GEISTESZUSTAND DER EPILEPTISCHEN. Von D. K. Gallus. Potsdam, Sammlung klinischer Vorträge, Volkmann, 536-537. J. A. Barth. 1 Mark.

The description of the epilepsies varies considerably, according to the standpoint of the author, particularly whether these manifold variations are described by the internist or by the psychiatrist. It has been within comparatively recent times only that it is realized that epilepsy is not a unicum, and it would be natural to find that a careful study of the mentality of these patients would yield useful diagnostic and prognostic material. Such is the value of this short monograph which will well repay studying.

JELLIFFE.

MODERN PROBLEMS IN PSYCHIATRY. By Ernesto Lugaro. Professor Extraordinary of Neuropathology and Psychiatry in the University of Modena; translated by David Orr, M.D. and R. G. Rows, M.D., with a Foreword by T. S. Clouston, M.D., LL.D. Manchester, University Press.

This is a delightful book. No work of recent years has been made available to English readers that combines such a masterly grasp of the problems of psychiatry with a charm of presentation that carries one from cover to cover without any cessation in the interest.

Although as seen from the author's introduction the work is meant in a certain sense to appeal to a nonprofessional as well as a professional public it is eminently one from which even the psychiatrist well versed in present day questions can derive both pleasure and profit.

In a general introduction the evolution of psychiatry is rapidly sketched and a general survey of the field outlined. Then follow chapters on the Psychological Problems, Anatomical Problems, Problems in Pathogenesis, Etiological Problems, Nosological Problems, Practical Problems, and General Conclusions.

In his first chapter various hypotheses concerning the general conception of causality are discussed. Mechanical determinism, materialistic and idealistic monism, scepticism, and realism are in turn examined, and their value in the elucidation of the practical problems of psychiatry pointed out.

Lugaro is thoroughly conversant with the anatomical advances that have been made in the last twenty years and has woven the new facts into

a consistent fabric in a manner that has not yet been attempted. He inclines to the views that support the general principles of localization and utilizes the newer studies of Campbell, Brodmann, Vogt and others to advance the general hypothesis of the multi-organ nature of the cortex, not only from a strictly gross topographical point of view, but from the standpoint of functional localizations in different layers within a topographical area. His handling of the question of the anatomical foundations of the mechanisms of association is especially able and he finds no strong conflict between the associationist and apperceptionist doctrines. At the same time he points out their hypothetical nature, while emphasizing the value of such hypotheses for scientific study. The filtration function of the neuroglia is brought into prominence by him.

The problems of pathogenesis he holds are still very vague but he states them with a lucidity which compels attention.

The discussion of the etiological problems is equally sincere and complete, special attention being given to the factors of heredity.

While comparisons between the different chapters can be made only in the most general sense, that on Nosology is particularly valuable since the problem of classification of mental disorders is peculiarly difficult not only so far as coming to a conclusion is concerned but even as to the mere statement of the intricacies. The author shows himself to be a Kraepelian in tendency and conclusions and in sympathetic understanding.

Under the head of Practical Problems Lugaro discusses questions of eugenics, of housing and caring for the idiots and imbeciles; asylums in general, their aims, limitations and needed modifications, prophylaxis and mental hygiene, medico-legal and penological considerations. These last are especially well worth reading.

As stated in the opening sentence of this review, this is a book well worth while. It will not grow old for some time, for the author has caught the knack of a philosophical mode of handling his subject which with a broad experience, a ripened judgment and a fund of common sense renders the work the best we have seen in many years.

JELLIFFE.

LE TABES ET LES MALADIES SYSTEMATIQUES DE LA MOELLE. Par Dr. E. de Massary, Médecin des Hopitaux de Paris. Paris, Octave Doin et Fils, éditeurs. 5 francs.

Dr. Toulouse of Villejuif has just projected a series of small manuals on neurology and psychiatry, of which this is one of the most recent. It includes Little's disease, tabes dorsalis, amyotrophic lateral sclerosis and Friedreich's disease. It is a part of a somewhat extensive scheme of a scientific encyclopedia, neurology and psychiatry being accorded twenty volumes in the set.

The present volume of 350 pages offers a very creditable description of the disorders under discussion. It lacks the completeness of the Nothnagel monographs which perhaps is some advantage for the reader who wishes an authentic, readable and yet not too extensive a treatise. The individual books can be carried in the pocket and thus the clumsiness of "system" volumes is avoided. The binding is thin and serviceable. Altogether it will make a very useful volume.

JELLIFFE.

STUDIES ON CRIMINAL RESPONSIBILITY, AND LIMITED RESPONSIBILITY. By Charles Follen Folsom, A.M., M.D., Formerly Visiting Physician for Nervous Diseases, Boston City Hospital. Privately printed, 1909.

These studies of Jesse Pomeroy, Charles Guiteau, Marie Jeanneret, Christiana Edmunds, Sarah Robinson and Jane Toppan have been collected and put together in a book of some 150 pages. We can recommend these short studies, since Dr. Folsom labored earnestly with the problem of criminal responsibility. Although not showing deep insight into the methods of more recent clinical psychiatry they have a good common-sense ring and from the English standpoint may be considered as valuable documents. One would not turn to the volume for any help in clarifying one's notions of the difficulties of medico-psychological problems but will gather good clear accounts of instances which may be useful.

BROWN.

The Journal OF Nervous and Mental Disease

An American Journal of Neurology and Psychiatry

Original Articles

TUMORS AND CYSTS OF THE SPINAL CORD WITH A RECORD OF TWO CASES¹

BY CHARLES K. MILLS, M.D.

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The subject of tumors and cysts of the spinal cord, like that of similar lesions of the brain, has passed through several periods during the last thirty years. Neurologists and surgeons, stimulated on the one hand by the development of both cerebral and spinal localization, and on the other by improved methods of surgical procedure, took up the question of the localization of such lesions and their removal, with enthusiasm. After a few years a lull of interest occurred, the result of various causes; but during the last ten years this interest has been reawakened and increased, chiefly because of our advance in knowledge regarding the functions of the brain and spinal cord, and the greater success which has attended operations.

In the early years of the period to which reference is made, several brilliant successes, well known to all familiar with the literature of this subject, were achieved in the case of spinal tumors, both in this country and abroad. Later a considerable number of operations were performed year after year, with varying success.

One cause of renewed interest in the subject of spinal surgery based on localization, is the new outlooks which have been secured through some particular lines of recent work. The

¹ Read at the thirty-sixth annual meeting of the American Neurological Association, held in Washington, D. C., May 2, 3, and 4, 1910.

observations of Sherrington have shown that the sensory root distribution is such that the destruction of a number of roots produces anesthesia only in the domain of a single root. This is an observation which is evidently important, as has been verified in my own recent experience. A patient, for instance, with distinct indications in neural pain and cutaneous hyperesthesia of the implication of one or two posterior roots, still is found to retain sensation in the areas of the skin in which the peripheral continuances of these roots are known to be distributed.

It may require a section or destruction by disease of three, or in some cases as many as five roots in order that a definite area of anesthesia shall result.

Through the investigations of Head, and those who have worked with him or have followed him, much more accurate information is now available, regarding the distribution and course of afferent nerves both in the periphery and within the spinal canal, this knowledge having some diagnostic value.

One distinct advance is that which has come from the extension of our knowledge of diffuse and circumscribed serous meningitis as the result of contributions by such neurologists and surgeons as Spiller, Pearce Bailey, Oppenheim, Schlesinger, and Horsley. Roentgen ray explorations have occasionally been found useful, especially in determining whether or not the bone is involved in a lesion.

The first case which I shall report is one with a tumor of the lower cervical region.

CASE 1.—*Intradural Tumor of Lower Cervical Region. Sharp pain in neck and shoulder for two years; weakness in left upper and later in lower extremity of the same side; moderate atrophy of the thenar and hypothenar muscles and small muscles of the hand; doubtful hypæsthesia on the ulnar side of hand and forearm; sense of position affected with slight ataxia of hand; all reflexes in left upper extremity impaired; the reflexes in left lower extremity increased, with Babinski response; reflexes on the right side present and probably somewhat increased; the skiagraphs showed a shadow apparently indicating increased density of the left halves of the fourth, fifth and sixth cervical vertebrae, and also an apparent shadow outside and to the left of the fourth and fifth vertebrae. Operation revealed intradural tumor reaching from about the fourth cervical to the seventh cervical vertebra; tumor removed with uneventful surgical recovery; pain, impairment of power, and other symptoms with*

the exception of the Babinski reflex, relieved; new syndrome consisting of contracted left pupil with partial ptosis and retraction of the ball developed after operation; tumor an endothelioma.

The patient is the wife of a physician, and was first seen by me in consultation with her husband on January 6, 1910. From this time until that of the operation, February 25, 1910, she was repeatedly examined by me. She was also examined by my colleague, Dr. William G. Spiller. The notes of various examinations made are summarized. This can be the more readily done as practically no change occurred in her symptoms during the four or five weeks she was under observation before the operation.

Mrs. S., 33 years old, had been married eight years, had two children, with a history of no miscarriages. Her father died when fifty years old as the result of disease, the diagnosis of which could not be determined. Before his final illness, he had had however attacks of dizziness with falling and unconsciousness. Her mother died at the age of sixty-seven, about three hours after an apoplectic attack.

The patient was a fine looking woman who usually enjoyed good health. She had had however several seizures which were called fainting spells, the last occurring about eight years previous to observation. In this last attack she lost consciousness, but had no spasm or other symptoms which were noted. An older sister had had similar fainting spells. She had three healthy brothers.

The chief thing to which attention was first directed two years before coming for examination, was the occurrence of pains in the back of the neck and left shoulder, which were at first and for some time thought to be rheumatic, but the pain did not respond to anti-rheumatic remedies which had been tried freely. Recently she had had spells of pain which would last five to twenty minutes and then disappear after exercise, to return again at intervals which increased in frequency. The pain in the back of the neck seemed to be somewhat different from that in the shoulder, being sharp and throbbing. During a week or two previous she had had some pain in the left upper limb below the shoulder. She had never had pain in any other part of the body.

About five or six months previous to the examination she first noticed some feeling of numbness or discomfort in the left arm, leg, and foot. She was not sure where these sensations occurred first, but believed it was in the hand. Gradually she became somewhat awkward and feeble in the use of both the left upper and lower extremities. The toes of the left foot would sometimes catch in the rugs or carpet when walking. In various ways the weakness and awkwardness in her left hand had become evident, as for instance when buttoning her own clothes or those of her children.

She had had at times difficulty in holding her urine, and she was constipated.

Examination showed her station with eyes closed to be good, but she could not stand as well on the left foot as on the right, owing apparently to weakness on the left side.

The patient wrinkled the forehead and closed the eyelids well on each side. The left corner of the mouth was not drawn up quite as easily as was the right corner. The tongue and soft palate were normal. The movements of the masseters and pterygoids were performed normally. The only evidence of motor impairment in the face was the slight difference in the power to draw up the left corner of the mouth, as compared with the right. This slight difference was probably natural in the light of subsequent findings.

The grip of the left hand was poor as compared with the right, the difference being greater than could be accounted for by her right handedness. She also had certain special conditions present in the left hand which proved to be of diagnostic importance. She could not flex the fingers of this hand forcibly so as to indent the palm as she could on the other side, and some atrophy was present in the small muscles of this hand. The little finger of the left hand tended to assume a peculiar position of abduction. It separated itself markedly from the ring finger, and the latter slightly from the middle finger, and the little finger could not be brought easily into apposition with the ring finger as upon the right side.

In a general way the movements of the left upper and lower limbs were reduced, although the only isolated loss of power was in the hand and finger movements as just described.

The finger to nose test showed slight ataxia which sometimes could be scarcely demonstrated.

Careful examinations were made of the face, trunk, arms, and legs with the view of determining whether any change of sensation was present. None could be determined except at one or two examinations she seemed to have on the postaxial border of the upper limb slight impairment of superficial touch, as tested by the von Frey hairs and cotton wool. No impairment of the senses of pain, heat and cold, or pressure was anywhere present. Some impairment of the sense of position was apparently present in the left hand, but this was very moderate and it was sometimes doubtful as to whether it was really present or whether the results were due to loss of power. Her fingers were used quite awkwardly, seemingly both from the impairment of power and of the muscular sense. This was particularly noticeable in observing the manner in which she used the index finger and thumb of the left hand as compared with the use of the right hand in manipulating objects. She recognized coins in the left hand, but some little difficulty was caused by the awkwardness of

her movements. She had no positive loss in the recognition of objects. Diadokokinesis was present in an imperfect degree in the left hand, but not in the right.

A comparison of the results of the examination of the deep reflexes in the upper and lower extremities was instructive. The von Bechterew scapulo-humeral reflex was present on both sides, but more readily elicited and more marked on the right side. The coraco-brachial reflex was present on both sides, a little more marked on the right. The biceps tendon reflex was present on both sides, but distinctly less marked on the left than on the right. The triceps tendon reflex was present, but not very marked on either side. The muscle jerks were prompt on both sides. Comparing the results obtained in the left lower extremity with those in the left upper, a notable difference was evident. In the left lower extremity the deep reflexes were all extremely marked. The knee jerk was very much exaggerated, and a typical Babinski reflex was present. No patellar or foot clonus was present. In the right lower extremity the knee jerk was marked, but less than on the left. No foot clonus or Babinski reflex could be elicited. At some examinations no metatarsophalangeal response occurred from plantar stimulation.

The tonicity of the left lower extremity was somewhat increased while that of each upper extremity and of the right lower extremity was about normal.

An electrical examination by Dr. A. R. Allen was made February 23, 1910. The various muscle groups reacted quickly to the faradic current. With the galvanic current the kathodal closing contraction was in all cases greater than the anodal closing contraction. The muscles tested were those of the shoulder girdle on the left, the left arm, anterior and posterior aspects, anterior and posterior aspects of the left forearm, and the intrinsic muscles of the left hand.

Dr. H. K. Pancoast reported the result of his Roentgen ray investigation as follows: "The skiagraphs show a shadow outside of the fourth and fifth cervical vertebræ on the left side. This shadow suggests osseous tissue and does not resemble sarcoma. The mass is small and lying in such a position that it might readily catch the posterior roots and press on them. The left halves of the fourth, fifth and sixth vertebral bodies seem a little denser than do the right halves."

The report is interesting as it apparently showed osseous rather than intradural disease, as was demonstrated by the operation. It shows that one may misinterpret somewhat the skiagraphic determinations in such a case. The misinterpretation however was not of such a character as to cause any doubt as to the propriety of surgical procedure. The shadow showing an apparent increased density of the bone, must in some way have been produced by the presence of the somewhat dense tumor,

unless there may have been also some increased density of the bone itself, which was not however determined. An endothelioma may by irritation cause some hypertrophy of overlying bone.

DR. CHARLES H. FRAZIER'S NOTES OF THE OPERATION.

A laminectomy was performed under ether anesthesia preceded by morphine and atropine. A semi-lunar skin flap was made and an excision made in this flap to the left of the median line. This was dissected up by means of a chisel, and the muscles and flesh were stripped from the underlying vertebræ. The spinous processes of the fourth cervical vertebra, the spine and lamina of the fifth cervical and a portion of the lamina of the sixth cervical vertebra were removed. There was very little hemorrhage. The dura was opened, and a small tumor about the size of a horse chestnut was located a little above the level of the fifth vertebra. The posterior root of the sixth cervical nerve ran over the mass, and it was impossible to say whether the anterior root ran through it or not. The posterior root of the fifth cervical nerve ran over the upper end of the mass. The tumor was very friable and was removed piecemeal by a curet and forceps. At times in removing the mass there would be marked twitching of the left shoulder. The dura was closed and the skin and flesh put down after the introduction of a small cigarette drain.

The pathological report was as follows: The specimen is a portion of a tumor removed from the spinal cord. It is about the size of a pea and shows signs of hemorrhage and infiltration, the remaining portion of the tissue being white in color and soft in consistency.

Microscopically the growth is composed of cells which belong distinctly to the connective tissue group. They are usually spindle shaped arranged in fasciculi which form interlacing whorls. In some places the tissue is very loose, almost embryonic in character. There is no stroma save that furnished by the processes of the tumor cells. The growth is irregularly canalized by blood vessels and appears well nourished. There is some free hemorrhage into the tissue. No mitotic figures are seen. The appearance corresponds to that of an endothelioma according to the ideas of Mallory.

The patient made a good surgical recovery, being able to sit up in about five days and was out of bed a day or two later. As soon as it was possible to make a neurological investigation without affecting the patient's surgical state, examinations were made. These showed improvement of the sensory, motor, trophic and reflex symptoms present before the operation, on the basis of which the diagnosis was made and the operative procedure

advised. It will be only necessary here to give the results of a complete examination made nineteen days after the operation.

The patient stated that she felt unusually well as regards her general condition, and also that the pain had left the region of her left shoulder and left arm. She said that she was conscious of an ability to use her left leg and arm more easily and freely than before the operation. Her station was good, and she walked with freedom and a fair show of strength.

The left pupil was smaller than the right, as it had been ever since the operation. She had also a slight drooping of the left lid, and an inability to retract the lid as well as on the other side. When she looked straight ahead the left eye did not uncover quite as well as the right.

She used her arm on the left side more freely than before the operation. She was able to indent her fingers in her hand better than she did before the operation, but not as well as on the other side. There was a positive improvement as compared with the examination before the operation. The little finger no longer assumed the position of abduction and partial flexion which it did formerly; all the fingers including the little finger could be readily brought together and separated. Her grip was improved.

Tests for sensation in her arm showed no alteration in touch, pain or temperature. The sense of dulled perception which was formerly present on the back of the arm was now absent.

Since the operation the patient had complained of sensitiveness in the palm of the hand and on the palmar surface of the fingers, both subjectively and to pressure. Her left hand was more sensitive than the other when she washed it.

In the left upper extremity the deep reflexes—the tendon and muscle jerks—undoubtedly presented a different response from that exhibited before the operation. The von Bechterew scapular, coraco-brachial, triceps, biceps, wrist and finger jerks were all easily produced and quite as well marked as on the right side.

All movements of the lower extremity were preserved, showing little or no loss on the left side. No loss or impairment of sensation or hyperesthesia was present in the left lower extremity. The deep reflexes—knee jerk, quadriceps and ankle jerk, etc.—were all well marked and a Babinski response was present on the left; on the right all the deep reflexes were plus. No Babinski was present and no foot clonus on the right.²

² Since the presentation of this paper at the meeting of the Association in May, another examination of the patient was made on June 9. The results of the examination were in most respects the same as of that made nineteen days after the operation. The arm and leg had retained all the improvement in power then noted. The pain in the shoulder and arm with which the patient had been so much distressed for many months, was absent.

This case presented the cardinal symptoms of a unilateral extramedullary tumor of the lower cervical region, in this designation including the first thoracic segment. The pain which was the first and always the most distressing symptom, indicated in the main the upper pole of the growth. The general impairment of power in both the upper and lower extremities, and the increased reflexes in the lower extremity, were due to compression of the pyramidal tracts of the left side. The absence of anesthesia, or at least its presence in only very slight degree, is probably to be explained by the fact that although two or more sensory roots may have been involved, the sensory supply from other roots replaced this loss by overlap. Besides the pain which the patient suffered in increasing degree as time went on, some cutaneous hyperesthesia was present in the upper arm, this also indicating the irritation of posterior roots.

The well-known Klumpke symptom complex consists of the ocular phenomena which were present in this case after the operation, plus more or less paralysis in the domain of the brachial plexus and especially in the distal portion of the upper extremity. This symptom complex can undoubtedly be produced by interference with the rami communicantes within the spinal canal. On the removal of the growth, the paresis previously present in the distribution of some of the component roots of the plexus, disappeared, leaving the unusual symptom complex here described.

The tumor proved to be an intradural one, probably growing from the inner surface of the dura. The differential diagnosis between an extradural and intradural but extramedullary, and an intramedullary tumor, has some interest in connection with this

The position of the fingers was practically normal. The patient however complained of some pain in the left index finger and forearm, this recurring every four or five days. When taking a bath she had some hyperesthesia to heat on the left half of the body, this passing away quickly. There was some impairment of the movements of the arm in trying to elevate it above the shoulder line or in moving it outward and upward. (This may be due to the cutting of the muscles of the back, chiefly of the trapezius, at the time of the operation.) The hand and finger movements were good with only slight impairment of the grip of the left hand. The reflexes of the upper extremities were all exaggerated and slightly more on the left. The lower extremities showed no weakness or sensory changes. The reflexes were normal on the right side but much exaggerated on the left, without foot clonus. The Babinski response was positive on the left. The eyes showed a slight degree of ptosis on the left though not so marked as when previously examined. The contraction of the left pupil was very slight.

case, and may be in any case a matter of some practical importance. It is certainly easier to discriminate between a tumor beginning in the medullary substance and one originating either from the inner or outer surface of the dura, than between the two forms of extramedullary growth, the extradural and the intradural. It is indeed practically impossible to make the latter distinction in some instances. In the first place, an intradural tumor, whether it originates from the dura or from the pia arachnoid, will have nerve root symptoms, posterior or anterior, similar to those of the extrameningeal growths, pain, hyperesthesia, impairment of sensation in root distributions when the posterior roots are implicated, and localized paralysis, atrophy, and vasomotor phenomena if the ventral roots are involved, also the results of interference with the vascular and lymphatic supply of the cord.

Later when the cord is compressed or invaded, true medullary symptoms begin to appear, those indicating for instance the involvement of the anterior or posterior horns and pyramidal or other tracts. The effects of compression of the pyramidal tract on one side will usually make their appearance early, these of course varying according to the location of the growth. If this be in the cervical region, some evidence of the pyramidal compression may be present in the arm, or such evidence may be masked by the more direct results of interference with the roots and cornual substance. The symptoms exhibited in the lower extremity will however be more or less purely pyramidal, showing themselves especially in some general loss of power in the limb and in exaggeration of the reflexes, both deep and superficial. All these points were well illustrated in our case.

The myosis, retraction of the eyeball and partial ptosis were post-operative symptoms probably due, as has been already intimated, to destruction within the spinal canal of the branches of communication from the cord to the sympathetic.

CASE 2.—Chronic spinal meningitis with subpial cyst; cyst evacuated; much improvement in voluntary movement of the limbs after the operation; cystitis; marked mental symptoms.

Although the opportunity was not offered by necropsy of determining the exact conditions within the spinal canal, the history and the results of operation in the following case would seem to indicate that it was probably one of chronic spinal meningitis or tumor, with a circumscribed subpial cyst. The patient was

first seen by me in consultation with Dr. W. M. Hepburn, at Freehold, N. J. He was afterwards removed to the Hospital of the University of Pennsylvania on March 14, 1905, where a laminectomy was performed by Dr. Chas. H. Frazier, on March 20, 1905. The following is a somewhat condensed history of the case:

The first symptoms of the patient to which much attention was directed were in September, 1904, although prior to this he probably had had pain in the back and had not been quite like himself.

In September he went to bed with pain in the back and lower spine with some irritability of the bladder, that is he had to pass urine quite frequently and complained of pain in passing it. He was in bed for at least three weeks with this pain in the back and the accompanying symptoms. At this time he had no paralytic or spasmodic symptoms, simply the pain in the back.

Prior to this illness the man had a long history of what seemed to be perfect health. He was a man of excellent habits. He positively denied syphilis and had lived a very correct life.

He went along, the pain in the back not entirely leaving him, and after a time developed pain in the region of the left sciatic nerve. There was tenderness at the sciatic notch and also more or less pain and tenderness along the line of the nerve.

In the latter part of October, at a time when the weather was severe, there being a great wind storm, he had much increased pain in the back and leg, apparently as the result of taking some cold. He went to bed and was found to have a temperature of 103° . At this time he also complained much of the pain in the leg. This attack passed off in a week or ten days. On two or three occasions later, at intervals of about ten days, he had attacks not so severe, showing themselves with a higher temperature and increased pulse, accompanied by pain in the back and in the leg.

In the latter part of November he was taken with another attack without fever, in which he suffered pain over the region of the right kidney, and had also severe vomiting spells. He had one or two later attacks, and then these disappeared and never returned. He was much prostrated after these attacks, but gradually picked up until he was able to sit in a chair. Up to this time he had not been paralyzed in any way, although his pains had more or less continued.

In the latter part of December he was seen by Dr. Janeway, of New York, who discovered some anesthesia up to the level of the lower portion of the dorsal region, but nothing else, except the pain. Dr. Janeway thought that a tumor or caries might be developing.

About the middle of January the patient became paralyzed in both lower extremities, and for some days previous to this he

had felt a weakness in his legs coming on. He could not stand up quite as well as he had done formerly.

Since this attack of paraplegia he had been in bed, helpless, at times suffering much pain, with inability to pass his urine part of the time.

A special examination was made by me just after his admission to the University Hospital, on March 14, 1905, the notes of which were recorded as follows:

As nearly as could be determined, the patient indicated that the pain was from about the mid-dorsal spine downward. As he described it, it seemed somewhat diffuse, although he indicated much pain in the lumbar and sacral regions. He complained that at times pains shot around the trunk towards the groin and also down the left leg.

He was totally paralyzed in both lower extremities, except that he could make slight movements of the whole leg, apparently by some of the trunkal muscles. Inspection showed that the left leg was larger than the right leg, especially below the knee, but he attributed this difference to a condition following typhoid fever some thirty years before. The left lower limb had probably enlarged as a result of a phlebitis following the typhoid attack.

Testing the reflexes in the right lower extremity, the knee jerk was found to be greatly exaggerated. Patellar clonus and foot clonus were very marked, the latter persistent; muscle jerks were also marked. The Babinski response was present.

In the left lower extremity the knee jerks were much increased. Patellar clonus was present. Persistent foot clonus could not be elicited, but it was imminent as shown by one or two oscillations. The Babinski response was present.

A not very elaborate examination for sensation showed that he was hypalgesic below a line about three inches above the umbilicus.

He was unable to pass his urine, requiring catheterization four times in twenty-four hours. In handling the patient it was noticed that he complained much of pain in the back and lower extremities. How much of this was psychic it was impossible to say. Sensation for heat and cold was not altered.

Electrical examination of the patient was made by Dr. Charles S. Potts, who reported as follows:

All muscles of both legs responded normally to the faradic current. The gluteal muscles responded well. Abdominal muscles responded well, but required a stronger current (about two inches of the nose of tube withdrawn) than did the muscles of the legs. The left side required a stronger current than the right. The muscles of the back in the lumbar region on the right side apparently did not respond to the faradic current, with the secondary coil switch on button, no. 2 tube completely with-

drawn. On the left side there was a slight response with a current not quite so strong as this. The muscles in the upper part of the back responded well. The patient apparently knew when the muscles were contracting, and strong currents caused expressions of pain.

Examination of the eyes by Dr. G. E. de Schweinitz showed them to be absolutely normal.

On March 20, 1905, Dr. Frazier operated as follows:

When the dura was opened, in about the middle of the opening, at about the junction of the seventh and eighth vertebræ, a cyst protruded. It was 3.5 cm. in length. The upper and lower ends of this cyst were exposed; the wall of the cyst was formed by the pia; the fluid within the cyst was clear, and resembled cerebrospinal fluid. When a puncture was made in the cyst wall, the fluid escaped and the pia collapsed, and the cord then appeared to be normal. The cyst upon first appearance seemed to be gelatinous, but on further examination it was found not to be gelatinous.

The dura was closed with a continuous silk suture; the muscles and the skin with continuous catgut.

The patient remained in the hospital until June 14, 1905, when he was taken to his home. He died after some months but no necropsy was obtained.

He became more profoundly paralyzed, wasted and contracted. He continued to have severe cystitis. His mental condition was not good but was variable. He apparently died from exhaustion and secondary conditions.

A diary of his condition was kept at first from day to day, and later at short intervals. Briefly summarized the salient features of his condition after operation were as follows:

The pain at first was entirely relieved by the operation. Later at times he suffered considerable pain, especially in the abdominal region. Cystitis was present and was appropriately treated by irrigation, urotropine, etc. So much power returned in his lower extremities that he was able to draw the limbs up and down and to perform various gross movements with them. After a time voluntary movement returned, even in his toes. He had a variable temperature, pulse and respiration, this probably depending in part at least, upon the condition of his bladder. In a short time he developed rather active mental symptoms, suffering from more or less delirium, at times amounting almost to mania. Eventually a brace was used and he got up into a chair, but his mental and general condition did not greatly improve.

The appearance presented in this case when the dura was opened was almost identical with that observed in the case recorded by Spiller, Musser and Martin.³ The result of the sur-

³ Spiller, Wm. G., Musser, J. H. and Martin, E., A Case of Intradural Spinal Cyst with Operation and Recovery, University of Pennsylvania Medical Bulletin, March and April, 1903.

gical interference was however, not as fortunate, but it will be remembered in the case recorded by these observers that the symptoms were much less pronounced. In their case the history had extended over several years, although the most important manifestations began two years before operation. The main feature for a long time was pain of a severe type, present in the left lower extremity and back, and at times in the extremity of the other side. As time advanced the pain increased and ramified to some extent, but always remained most marked in its early locations. The deep and superficial reflexes in the lower extremities in this case were at first much exaggerated but later changed, diminishing in the case of Achilles jerk on one side, and both knee jerks disappearing. Paralysis, contracture and atrophy never occurred, although weakness was present in the left leg. Anesthesias were not present but the patient complained of a pronounced paresthesia in the left foot. The bladder and rectum were not involved. The result of the operation by Dr. Martin was the relief of a large part of the pain suffered by the patient, this relief continuing up to the time of reporting the case several months after operation.

Prior to the publication of the case of Spiller, Musser and Martin, two cases of spinal cyst had been recorded by H. Schlesinger,⁴ in his monographs on tumors of the cord and vertebrae. In only one of these cases had a clinical study been made which could be referred to the lesion found on necropsy. The other cyst was discovered accidentally in a necropsy in a case of sclerosis of the brain and the spinal cord.

The first of these cases briefly summarized was that of a man thirty-six years old, the duration of whose disease was nine years. The first evidences of affection were pain in the neck and paresis in both legs. The symptoms exhibited frequent exacerbations and remissions and other vacillations. At times there was destrusor paralysis. After nine years duration a girdle sensation developed, with hypesthesia of the legs and slight bladder disturbance. Death occurred from an intercurrent disease. The circular or oval cyst, 3 cm. long was below the cervical enlargement and filled with clear fluid.

The case here recorded bore in some of its early features, a

⁴ Schlessinger, H., *Beiträge zur Klinik der Rückenmarks- und Wirbeltumoren*, 1898.

similarity to that of Spiller, Musser and Martin, especially in the presence of severe pain localized in the back and lower extremities, and in the exaggeration of the reflexes. Later, however, as will be recalled, atrophy, contracture and paralysis, with serious impairment of the functions of the bladder occurred.

Bliss⁵ has recorded two cases of cysts within the spinal canal.

The case recorded in the *Journal of the American Medical Association* had much in common with the case here reported, being more similar to it than that of Spiller, Musser and Martin. In the case of Bliss there were anesthesia, paralysis, contracture, etc. The result of the operation was very satisfactory in the relief of pain, the return of sensation and power, and the improvement in the reflexes.

Bliss⁶ has published another article briefly reviewing the subject of circumscribed serous spinal meningitis and especially calling attention to the cases of so-called cysts associated with chronic spinal meningitis, in which list, as I have already indicated, my case would probably fall.

Krause⁷ has recorded three cases in which tumors were diagnosticated but cysts discovered at the operation. In two cases the fibrous overgrowths extended even into the cord substance. In two cases there was stasis of the fluid above the cysts so that a very marked variation in the symptoms occurred and the upper border of the disease was very hard to fix.

The subjects of chronic diffuse spinal meningitis with more or less generalized effusion and of circumscribed serous meningitis are of great importance in considering the question of tumors and cysts of the spinal cord, and demand our attention especially in discussing case two. Some of the first observations were made regarding this subject in this country, as Sir Victor Horsley⁸ states, by Horatio C. Wood, of Philadelphia, in a contribution on syphilitic spinal meningitis, and other forms of syphilis of the nervous system. As regards the question of circumscribed serous meningitis, the first observation in this

⁵ Bliss, M. A., Cysts Within the Spinal Canal, *Journal of the American Medical Association*, Vol. 52, No. 11, March 13, 1909.

⁶ Bliss, M. A., Circumscribed Serous Spinal Meningitis, *Inter-state Medical Journal*, Vol. XVI, No. 5, May, 1909.

⁷ Krause, F., Ueber Schwartenbildung am Rückenmark (Meningitis fibrosa chronicalis), *Die Therapie der Gegenwart*, Vol. XI, No. 12, December, 1909.

⁸ Horsley, Sir Victor, Chronic Spinal Meningitis, *The British Medical Journal*, Vol. I, Feb. 27, 1909.

country, as also indicated by Horsley, was made in a paper by Drs. Spiller, Musser and Martin the one describing the case to which reference has just been made. At necropsy I have seen several cases of the sort described by Horsley, in which a diffuse pachymeningitis or a condition of hypertrophic pachymeningitis with several foci of great thickening were found.

In the cases of chronic spinal meningitis to which Horsley refers, the excessive cerebrospinal fluid present is not always, or perhaps frequently, in a strict sense, circumscribed. It extends more or less up and down the cord, with a place of greater accumulation at some point. This place of special distension or enlargement may serve as a guide to the site and upper limit of operation.

It is a remarkable fact that Horsley has operated on no less than twenty-one cases of chronic spinal meningitis with more or less serous effusion, and has been able to bring about either a cure or great improvement in a number of cases. He has also demonstrated the real pathology in these cases by at least two necropsies with microscopical examination. In one of these an operation had been performed; in the other the true nature of the case was discovered, or at least proved, at the necropsy. The membranes in these cases were greatly thickened. It might be said in passing that the areas of thickening in such cases may differ greatly at different heights.

Some of the diagnostic points between these cases of diffuse or of circumscribed serous meningitis and spinal tumor are, as pointed out by Horsley: (1) In tumor the pain is apt to begin and to be more or less limited to a single nerve area, whereas in chronic meningitis a number of nerve distributions may be affected. The whole column may take more or less part in the pain. (2) Not only does this diffusion of symptoms and signs hold good with regard to pain, but there may be also a larger diffusion of such symptoms as paralysis, atrophy, cutaneous eruptions, etc. (3) The case progresses somewhat differently from that of a tumor.

Oppenheim⁹ regards as characteristic of meningitis as compared with tumor only the slow progress of the symptoms and the tendency to remission, and claims that even with these present, tumor and meningitis may be confused.

⁹ Oppenheim, H., Diagnose und Behandlung der Geschwülste innerhalb des Wirbelkanals, Deutsch. med. Woch., No. 44, Nov. 4, 1909.

Cases of tumor, as well as the cases described by Horsley, must be differentiated from cases of cysts of a strictly circumscribed character like one recently presented by Weisenburg¹⁰ at a meeting of the Philadelphia Neurological Society. In this case the affection was supposed during life to be a tumor, but a circumscribed serous cyst was found and the patient was completely cured by operation. The point made by Weisenburg in the presentation of this case can probably be maintained only in a limited number of cases, namely that a differentiation between a spinal cord tumor and a cyst can sometimes be decided by vacillation in the focal symptoms. In his case, for instance, the sensory symptoms present on one day or at one time, representing one half of the cord, at the next examination were found to be indicative of involvement of both sides of the cord.

In the case of a cyst of the spinal cord, as in one of the brain, some of the symptoms show an unusual variability. In a brain cyst, for instance, which is associated, as is not infrequently the case, with tumor, the vacillation in some of the symptoms leads to doubt as to diagnosis, and the same is true, although to a less extent, of lesions purely spinal. Impairment of movement, and changes, impairment or perversion of sensibility, and even the state of the reflexes may differ from time to time, probably because of variations in pressure according to the condition of the cyst at different times. Similarly the level of a spinal lesion will seem to vary in an unusual way as indicated by the differences in such manifestations as hyperesthesia or anesthesia, paresis or reflex disturbances, and this apparently in accord with the relative filling and emptying of the cyst. The amount of fluid in these cysts evidently varies at different times. This may depend upon several circumstances, variations in the conditions of the lesion which induce the secretion, absorption under the influence of treatment, and variations in the position of the patient.

Care must be taken in drawing conclusions from variable conditions of this sort in determining whether the cyst, if it is associated with a tumor, is producing these variations from above or below the level of the mass. In the case of a purely cystic formation the variations will probably be in all directions. Such

¹⁰ Weisenburg, T. H., Idiopathic Circumscribed Spinal Serous Meningitis with the Report of a Successful Operative Case. *The American Journal of Medical Sciences*, 1910.

variations however, will chiefly take place where the condition is one of stasis associated with tumor or meningitis.

In discussing the question of vacillation of symptoms in different forms of lesion under consideration, Oppenheim says that the most important sign in the meningeal growth is the constancy of the upper pole symptoms, while in the intramedullary growth there is a tendency to a meningeal spinal extension with a change upward in the level of the symptoms.

As a rule a serous or other cyst, if unassociated with a tumor or meningitis, will not cause the same degree of pain which is produced by a tumor involving membranes of the cord, especially the posterior nerve roots, but such a rule is not without exception.

In the case reported by Spiller, Musser and Martin, pain in the lower extremity and also in the back was a prominent symptom, and was relieved by an operation which resulted in the discharge of what appeared to be a circumscribed serous cyst.

With regard to the subjects under discussion Oppenheim has probably written more fully and lucidly than any other contemporary neurologist. With regard to circumscribed serous meningitis (*meningitis serosa spinalis circumscripta adhesiva*), he says that in this there is "A fibrous inflammatory process forming adhesions with the arachnoid. These spaces then become filled by an increase of fluid. One may find several cysts formed, or only one cyst with stasis above the cyst, but with a free circulation of the fluid upwards. This process may occur alone or secondary to a tumor or vertebral disease."

If upon operating for either a tumor or a serous condition, the dura is found greatly stretched and non-pulsating, and upon cutting it, it is found that the liquid gushes out under considerable pressure and in large amount, the meninges seeming however otherwise normal, meningitis serosa is not the only disease present, but the condition is a fluid stasis above or below the tumor. By sounding or further laminectomies the tumor will be found. If by sounding bounding walls are found it is a *serosa circumscripta*.

Serosa circumscripta may even cause a flattening of the cord at the level of the cyst. There may be however, an effusion in the membranes with the formation of a cyst above a tumor caused by edema of the arachnoid.

In the case of circumscribed cyst here described, the probabilities are great that this formation was associated either with a tumor or with a meningitis situated mainly below the site of the cyst. This is indicated by the merely temporary relief of some of the important symptoms, and by the subsequent course of the disease to a fatal termination.

MYOSITIS OSSIFICANS¹

By JOHN K. MITCHELL, M.D.,

It is seldom desirable to report a single case but the one I have to present contains certain features of interest great enough to warrant consideration, especially in the unusual amount of improvement made under treatment, so great indeed that it seemed to promise something approaching a recovery, had not an accident intervened.

D. S. F. Male, aged 29 years, single, dentist. Admitted to the Infirmary for Nervous Diseases, January 29, 1908.

Parents living and well; nothing of moment in family history. When 6 years old patient had varioloid, and typhoid when 16. He had had gonorrhea twice but denied syphilis. Otherwise he was perfectly healthy, used alcohol and tobacco moderately, led a regular life and worked hard at his profession.

In 1905 he was much overworked and broke down. He became weak and nervous with all the general symptoms of a marked neurasthenia and this was shortly followed by an illness diagnosed as an acute dilatation of the heart, with fever and great prostration. After a few weeks he gradually improved but never regained his strength. Four months later, three years before examination, he first noticed stiffness of the quadriceps muscle of the right thigh. This gradually increased and the biceps of the right arm was soon slightly involved. Then the quadriceps and vastus muscles of the left leg were affected, and later the biceps, supinators, flexors and extensors of the left arm, but while this was occurring the biceps of the right arm entirely recovered.

During November and December of 1907 he was put to bed by his own physician, Dr. New, of Indianapolis, and was given mercury, etc., but he was quickly salivated and became worse. During this time he first noticed some difficulty in swallowing and chewing. His general health at the time of admission in January, 1908, except for the local muscular difficulties was moderately good but he felt weak and thought himself getting worse.

Physical Examination.—Well made, strongly built man, 6 ft. high; normal weight, 200 pounds; present weight, 157. Pupils are equal and react normally to light and accommodation. Ocular

¹Read at the thirty-sixth annual meeting of the American Neurological Association held in Washington, May 2, 3 and 4, 1910.

movements good. Tongue is protruded straight and can be freely moved in all directions. The muscles of the pharynx appear to act normally as far as can be determined by inspection and palpation.

The lungs are normal. The heart dulness is doubtfully increased to the left.

Both arms are held in partial flexion and cannot be fully extended. The biceps, deltoid, triceps, supinators, extensors and flexors of the right arm are all involved. They seem hard and dense and possibly slightly increased in size. There is no pain; on attempting motion the muscles do not appear to contract. The small muscles of the right hand are slightly wasted, particularly on the thenar and hypothenar eminences. The hand cannot be pronated and supinated as far as it should be. There is much difficulty in flexion and extension of the fingers on account of the opposing action of the affected muscles of the forearm. The left arm is similarly affected, and there seems to be a partial bony ankylosis at the elbow, but the small muscles of the hand although wasted are not so much atrophied as on the right side. The muscles of the thighs and the calves of the legs are affected on both sides, chiefly the extensors, though the flexors and adductors are also involved but to a less degree. The muscles are all hard and dense to the touch, and this hardness is much increased on muscular effort. The legs cannot be fully flexed on the thighs on account of the rigidity of the muscles.

The tendon reflexes are present but small and difficult to elicit. The skin reflexes are all normal. Sensation is everywhere normal for touch, pain, localization, heat and cold. There is no Babinski sign and no clonus. Neither exercise nor passive movements seem to have any influence in lessening the rigidity. The muscles are said not to relax during sleep. The muscles of the trunk are so far as can be determined not affected.

An electrical examination made by Dr. Boyer showed that there were no reactions of degeneration anywhere, although the affected muscles do not contract well with either current, but this is probably due to the lack of tone. The small muscles of the hand require from 3 to 4 ma. but this is probably in proportion to the amount of atrophy present. The muscles of the pharynx and larynx could not be tested because there was such great sensitiveness in the throat region even to the weakest current.

The extensor tendons of both great toes are under extreme tension. The third toes show slight tension. Motion is somewhat limited in right foot; less in the left foot.

Flexion of the knees is limited to a range of about 8 inches and ceases with a sudden checking of the movement. The thighs can be flexed to an angle of about 50 degrees with the bed. The limitation of movements seem to be due to tonic contraction of opponent muscles. The passive lifting of a limb or the active

willing of movement seems to throw the opponent muscles immediately into action. When the leg is lifted very high there is evident stiffening in the muscles attached to the pelvis. At a certain point even passive lifting of the leg hardens the muscles *in the other leg*, a condition which is very much more evident in the right thigh muscles when the left leg is raised than in the left thigh muscles when the right leg is raised.

In the right hand the third and fourth fingers are partially flexed, being held by the contraction of their tendons when the wrist is extended. There is slight constant resistance of opponent muscles of forearm. At one time he could not extend the right elbow on account of the biceps contracting instead of relaxing when the other muscles were called upon by the will.

The left arm cannot be supinated in any position. With very slow pressure the elbow becomes more extended. The supinator is painfully contracted on attempting extension, which it is impossible to accomplish. The biceps seems all right.

There is some difficulty in opening the mouth wide, owing to the tendency of the masseters to contract. He has a feeling of stiffness in the front muscles of the throat but no other trouble in the face muscles; he speaks of a certain sense of difficulty in swallowing either solids or liquids, so that voluntary effort is required.

Station is perfect and he can bend forward to an angle of 45 degrees. No painful point can be found anywhere except over the internal condyle of the left humerus. He occasionally has some dull aching in the thighs, no pain in the joints.

Blood examination showed H — 70 per cent.; red blood corpuscles 5,270,000.

Urine examination was negative.

Dr. Langdon made an eye examination and reported as follows: "The only sign of organic change to be found is a slow lateral nystagmus, which develops at the limits of lateral rotation, more marked to the left, to a fairly pronounced condition. At the upper limit there is a slight suggestion of it." His fundi are perfectly normal except that the discs are rather hyperemic, with the nasal margins somewhat blurred.

"His vision is 6/6 partly in each eye, due to a hyperopic astigmatism which should be corrected and which is probably responsible for his headaches."

On February 20 Dr. W. J. Taylor made an incision under local anesthesia about 2½ inches in length over the anterior portion of the right thigh. He removed a small portion of the quadriceps muscle. While removing this Dr. Taylor made the observation that the muscle tissue was somewhat paler than normal, but this might possibly have been due to the use of cocaine. The tissue was put immediately in Müller's fluid for sectioning.

Report on Tissue from Muscle.—Dr. W. B. Cadwalder reports: the tissue removed at operation consists of a portion of the quadriceps muscle $8 \times 4 \times 3$ mm. in size. It is somewhat paler in color than normal muscle tissue. In consistency it does not differ from normal and has not a gritty feeling.

Microscopical Examination.—Stained with hemalum and eosin: there are many clumps of round cells scattered irregularly throughout the section, and many red blood corpuscles, the latter probably the result of operation. The walls of the blood vessels are slightly thicker than normal and infiltrated with round cells. In some parts of the sections the muscle fibers are atrophied and a few have entirely disappeared. There is much fibrous tissue widely separating the muscle fibers from one another. In this area when cut longitudinally the muscle fibers are much narrower than normal and the striations are very indistinct and the fibers have a glossy appearance when stained with eosin. On cross section they show pale striations radiating from the center to the periphery like the spokes of a wheel. Here and there the fibrous tissue can be seen surrounding muscle fibers as if causing much pressure on the atrophying muscle fibers until they have almost disappeared. (With the Marchi stain there was no fatty degeneration.) There is some increase in the sarcolemma nuclei. Nowhere in the tissue were there any osseoid plates found.

The condition is one of myositis fibrosa which may progress with the formation of osseoid plates. It seems fair to suppose that the changes found in this muscle also existed in other muscles, either in milder or more pronounced degree.

The patient was kept a short time in bed on milk diet and careful massage given as thoroughly as the condition of the muscles would permit. Moderate doses of iodide were administered. The food was gradually increased and when full diet was reached, he was got out of bed and encouraged to attempt walking, with crutches. In about six weeks he began to show some change for the better and in March the condition was described as follows:

The right foot had improved in mobility; the knees stopped suddenly short in flexion, as if some immovable rigid obstacle were encountered, when a certain small arc had been covered. The anterior thigh muscles, however, were softer and more relaxed and could be grasped in the hand and picked up, whereas formerly it was like trying to take up a handful of board.

The contraction of the muscles of one thigh when the other was raised—formerly noted—was much less marked than before.

In the right arm there was some relaxation of the contracted muscles; in the supinator longus an isolated mass remained about 3 inches below the elbow, the rest of the muscles being quite soft and natural to the touch and to palpation. The power of supination was very poor; the pronation was impaired; the third and fourth fingers were still fixed when the wrist was extended;

there was the same tendency of the opponent muscles to harden. The biceps lost its tendency to contract when the arm was flexed, but became tense when the elbow was extended.

On passive extension of the left arm pain was felt along the belly of the supinator longus. On attempting supination pain was felt in the flexor belly of the muscles below the internal condyle.

Later and up to his discharge from the hospital in April still further improvement took place and the hard stiff masses of muscle grew much softer. Two weeks after his return to his home he died of an acute pneumonia. No autopsy was permitted.

The points of interest in this case are the rapidity of onset, the extreme degree of fibrous change reached in a few months, then the very slow advance of the disorder for almost two years, and the very marked improvement in the condition under treatment, in which it is reasonable to conclude the massage very thoroughly given had the largest share.

The authors of the two or three monographs on fibrous myositis or the allied one of ossifying myositis all agree that improvement often takes place, sometimes spontaneously, sometimes under very varying therapeutic measures. In the present instance the patient's own opinion was that he was steadily growing worse when admitted. In day to day observation, after he began to be better, a remarkable change could be noted. The area of hardening diminished little by little, the freedom of movement of muscles that had been almost incapable of function increased in a like degree. In the right supinator longus muscle, for example, which had seemed all one dense inelastic mass, the hardening lessened throughout, until finally a certain lumpiness like that remaining after a slight cellulitis was all that could be detected. While it is not to be supposed that muscles which had undergone a degree of fibrous change such as was shown by the microscopic sections could have been restored to perfect functional activity, since fibrous tissue had to some extent replaced muscular tissue, yet I believe had the patient not died a reasonable degree of activity would have been restored to him.

On the other hand, had treatment not been successful in stopping the advance of the disease muscular degeneration must have gone on to a condition much more resembling ossification, to which the changes shown in this instance were probably preliminary.

MYASTHENIA GRAVIS

BY MAX G. SCHLAPP, M.D.,

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JAMES J. WALSH, M.D., PH.D.

DEAN AND PROFESSOR OF NERVOUS DISEASES AND OF THE HISTORY OF MEDICINE
AT FORDHAM UNIVERSITY SCHOOL OF MEDICINE

The symptom complex myasthenia gravis, which is as yet entirely a mystery and responds very well to George Eliot's description of modern scientific methods, when she said that we map out our ignorance in long Greek names, is scarcely a score of years old yet and used to be considered a very rare disease, but like so many other little-known diseases of comparatively recent time is now turning up rather frequently at least in hospitals and dispensaries if not in private practice. It certainly can no longer be described as a rare disease, and so a description of certain cases seen in the last two years, one of which at least has an etiological moment that seems of importance, appears worth while.

So far nothing in the nature of a proximate cause for the affection has ever been found though some hints as to the possibility of a remote connection with the function of the thymus have been made. In our case which was studied rather carefully and had at the beginning some appearances that might lead one to think of hysteria, for many of these cases in their early development are set down as hysterical, a story of fright was obtained, followed immediately by the gradual development of all the symptoms of myasthenia gravis that deserve further observation.

The patient was a young woman of twenty-four, a cashier in a store, who had held her position for some six years and who was very much thought of by her employers. She was a very sensible little body with no caprices, no nervous symptoms,

and none of the faults of disposition usually set down as due to a tendency to hysteria. She had been in perfect health, missing no time, undisturbed by her monthly sickness, with regular bowels and a good appetite. She was a favorite in her own family.

One evening in 1906 a brother, who had suffered from rheumatism, as a consequence of which a heart lesion had been left, was brought home dead. He had been on a trolley car when an accident happened and died from the fright. She was at home when he was brought in and she suffered severely from the shock, swooning away and then afterwards vomiting. She was better after half an hour, but she did not sleep that night and felt nauseated during most of the next day. She was unable to eat much for several days and headaches developed. These headaches were very severe and continued even after her appetite returned to a great degree, and when she thought that she was quite well otherwise. When she returned to work after the funeral she found that she was very easily tired and that her eyelids began to twitch. The left one was the first to be affected, but both bothered her after a short time. After the twitching had continued for some time she would find it easy to open her eyes, but rather hard to keep them open, and the lids would droop. Speech became very tiresome to her too, and and then after an interval she would be worse, and at the end of six weeks she found it very difficult to hold her eyelids up or to talk much, and some difficulty of swallowing developed.

The muscles of her face, especially of her eyelids and of her throat, were most affected, but general weakness of muscles throughout the body began to develop too, and she had to take to her bed. At the end of seven weeks it became necessary to feed her on liquid diet to a great extent, because chewing had become so difficult and the swallowing of anything except fluid brought on a choking attack. During the early days of her illness she had thought that her headache might be due to her eyes, and she had them fitted for glasses, which seemed to improve her vision for a while, but after a time her eyelids drooped in spite of her. When she tried to write the pen would drop from her hand after a time. These symptoms of gradual loss of use of muscles continued to develop for six months with certain variations. At times she persuaded herself that she was better, and then after an interval she would be worse and at the end of each month she was evidently more reduced in strength than before.

When she came to the Presbyterian Hospital Dispensary her weakness was so marked that she was recommended for admission to the hospital. At this time there was a typical Jolly reaction. The face muscles particularly responded very well for a while to the faradic current, but tired after a time; there was

complete failure of response. The muscles were evidently essentially weak. In the hospital she improved. She was fed more regularly, more care was taken of her nutrition, more encouragement was given her, and she was able to use her muscles better. At this time it seemed almost in spite of the characteristic Jolly reaction and the rather typical course of the case that the patient might be suffering from severe hysteria rather than hopeless myasthenia gravis. After two weeks indeed the improvement was so marked that the patient herself asked to be allowed to go out of the hospital, and the permission was granted. This was in March, 1907.

Her improvement maintained itself only for a short time, and then she began to grow worse again. During the course of six months the deterioration had proceeded to such a degree that she was admitted to the hospital once more early in December, and now there could be no possible doubt of the diagnosis myasthenia and she died December 23 from sheer weakness of the respiratory muscles, together with the malnutrition consequent upon difficulty of swallowing. The course of the case is typical of myasthenia gravis except that the intermissions were perhaps more marked than are usually seen.

The interesting feature of the case is the possible—indeed it would seem almost probable—connection of the shock or fright of having her brother brought in dead as the beginning of the ailment. It began immediately after. There had been no sign at all of it before, and absolutely no symptoms that would hint at its being about to begin. The disease came out of a clear sky quite as suddenly and as unexpectedly as the death of her brother itself, which so immediately preceded the first symptoms. It is hard to keep from trying to find a connection between the two. Such incidents have not been reported so far in connection with myasthenia gravis, though they are the sort that are not likely to be neglected if they are in the patient's history. In our other cases there is no trace of them. In another case under observation beside this we looked carefully for any possibility of an emotional shock or strain, but found none. Most of the myasthenia cases are in women, and occasionally it happens that they have severe emotional strains consequent upon sexual life of which nothing may be said. We have felt, however, that this feature of this case should be dwelt on, because of the utter lack of any suggestion of cause for the disease in the literature up to the present time.

The discussion of the etiology of myasthenia gravis in connection with the case described in this paper may be of interest. So far very little is known of causes direct or indirect of the disease. Careful examination of the nervous system in a large number of cases of myasthenia has revealed no pathological changes common to the cases or that would seem to be of any significance. The disease moreover has not the general appearance of a nervous disease. It reminds one much more of such an affection as Addison's disease. There is a loss of tone in the muscles in myasthenia, just as there is a loss of tone in the arteries in Addison's disease. Until the changes in the suprarenals were found in Addison's disease the cause of that affection was a mystery. Once they were discovered it was easy to understand it. When in addition it was found that tuberculosis was one of the most frequent causes of the degeneration of the suprarenals Addison's disease lost most of its mystery. It seems not unlikely that the underlying causative conditions in myasthenia resemble in some way those of Addison's disease, that it is probably due to a defect of some ductless gland secretion. The next question after that would be the cause for this glandular disturbance.

Weigert found a thymus tumor with metastatic growths in the muscles in one of his patients. Others have described an infiltration of the muscles and of the thymus gland with lymphoid cells, and an overgrowth of the glandular elements of the thymus. Whether this gland has something to do with the maintenance of tone in the muscles, and disturbance of it causes the lack of tone noted in myasthenia, remain to be determined by future investigations. The question of therapy is also concerned in this, and in one case brought to our notice a remission of the disease seems to have been brought about by the administration of thymus gland. Remissions and fluctuations of the symptoms are so characteristic of the disease, however, that it is difficult to determine whether in any given case a remission has been brought about by any treatment. In the therapeutics of a number of similar diseases—diabetes, Graves's disease and pernicious anemia—this same difficulty of determining the value of therapeutic suggestions has been found, so that it will be necessary to go very slowly in accepting definitely any supposed conclusions that are reached

in this matter until a number of cases have been under observation.

Knoblauch recently pointed out that there are two kinds of muscle substance in all muscles—light red and dark red. These two varieties of muscles are quite different in their action. The light red reacts promptly but tires easily. When used frequently muscles mainly composed of this substance grow fatigued. The dark muscle substance reacts slowly, but oft-repeated reactions are possible, and it does not tire easily. The muscles of the face and mouth and throat are more largely composed of the dark red muscular substance than of the light. Knoblauch has found that there seems to be a definite tendency for the dark muscle substance to disappear during the course of myasthenia. He has excised muscles from myasthenics and has found this to be true. On the other hand in myotonia the light muscle substance disappears to some extent with a corresponding overgrowth of the dark red muscle substance. Hence the symptoms of the two diseases. In myasthenia the patient can bring about action of the muscles without difficulty and promptly, but cannot repeat it frequently. In myotonia the action is brought about with difficulty and slowly, but can be repeated without exhaustion.

It is possible then that the secretion of the thymus gland represents some material that maintains the tone and the vitality of the dark red muscle substance. When this diminishes the white substance overgrows somewhat according to that law which seems to hold in all the tissues, that the disappearance of one form of tissue leads to hypertrophy of neighboring tissues of other kinds in the same order. It is possible that the thymus may have the double function of maintaining the vitality of the dark red muscle substance and inhibiting the light red muscle substance. Such double functions are rather common and to be expected in nature.

The shock or fright that represents the beginning of our case of myasthenia gravis may have disturbed certain trophic nervous influences that enabled the thymus gland to do its work. This is of course mere theory. It seems suggestive, however, and may be helpful in determining the indirect etiology, if further cases of myasthenia gravis prove to develop as the result of nervous shocks or emotional strains of a similar kind.

Society Proceedings

THE PHILADELPHIA NEUROLOGICAL SOCIETY

March 25, 1910

The President, DR. H. H. DONALDSON, in the Chair

A CASE OF BROWN-SEQUARD PARALYSIS

By Philip F. Williams, M.D.

G. D., aged 33, occupation bartender, was admitted September 28, 1908, to the Nervous Ward of the Philadelphia Hospital. He gives history of an initial specific lesion fifteen years ago with secondary symptoms.

Present illness has lasted for six years, beginning with a weakness in his left leg. The leg was easily tired on walking and dragged. He suffered severe pain in his upper dorsal region at this time. He has since then experienced a sensation of numbness in his right leg.

Physical Examination.—Lower extremities: Patellar tendon reflexes exaggerated on both sides and Babinski reflex present on both sides. There is patellar clonus and ankle clonus on left side. There is some spasticity on left side. On right side from the inguinal region anteriorly and gluteal crease posteriorly down over entire limb, there is an absence of correct perception of pain and heat senses. Tactile sense is preserved over both limbs. Gait shows a tendency to drag the left leg and patient swings foot outward. Station is normal. The rest of body negative on physical examination.

CASE SIMULATING PARIETAL LOBE LESION

By Philip F. Williams, M.D.

W. H., aged 44, laborer. Chief complaint weakness, pain and numbness in left arm and hand.

Personal History: Free alcoholic history, admits Neisserian and specific infection.

Medical History: Patient has had measles, typhoid fever and rheumatism.

Present Illness: Patient had sudden attack of numbness and twitching in his left arm and hand. He dropped a coin which he held in his hand. Shortly after a second attack followed, when his left arm shook so hard he had to have a man hold it. He describes condition as though a flame were being directed against the left arm.

Physical Examination: Arms—well developed. Left arm slightly spastic. The left arm weaker than the right. The grasp of left hand is very weak. The patient cannot hold any objects in left hand, dropping

them. Legs—Some weakness in left leg. Face—There is evident weakness on left side of face. The patient cannot raise left corner of mouth or wrinkle left face. Muscle sense is very much impaired. Patient does not place one hand on other except by chance. The same disturbance is noted in foot. Astereognosis present. Coördination—Ataxia present in both left limbs.

Sensation: Heat, pain and tactile sensations are all very much impaired over left arm, left face and left leg.

The reflexes are all normal.

On being quarantined some time after admission for Vincent's angina and fearing he might develop diphtheria the patient's condition immediately cleared up. He regained at once his perception of all sensations and power in left arm and leg. The astereognosis disappeared and his condition became normal in all respects.

A CASE FOR DIAGNOSIS

By Alfred Gordon, M.D.

The patient, a boy of 8½ years, was born at full term and normally. At the age of eight or nine months he had a series of infectious diseases, such as measles, pneumonia, profuse diarrhea. The latter particularly was of an unusually long duration. At that time the mother noticed that the child's head began to grow very large, so that at the age of three, judging from her description, the head was hydrocephalic. He began to speak and to walk only at the age of three. Shortly afterwards he developed epileptic seizures. For a period of two years the latter occurred quite frequently. They were all generalized in type. At the age of four nystagmus appeared in both eyes and the head became affected with nystagmoid movements.

At present the following symptoms are observed: The patient's head is dome-like; there is a flattening of both lateral halves of the cranium, and the vertex is elevated. The forehead is somewhat protruding and low. The eyes present some exophthalmos, more on the right than on the left. There is a rotatory nystagmus in the left eye and a nystagmus of both eyes on lateral movements. The head is animated at times with an oscillation from right to left and vice versa. The station, gait, sensations are normal; the reflexes are uncertain, at times are normal and at other times it is difficult to obtain them. The toe phenomenon is absent by Babinski's, Oppenheim's or Gordon's method. The eye examination made repeatedly by Dr. Pyle shows that the vision in both eyes is 6/30 and cannot be improved by glasses. There is chorioretinitis with optic atrophy in both eyes. The field of vision is contracted in both eyes, but particularly in the right. The patient has still convulsive seizures at irregular intervals, once in two or three months. They are generalized and not confined to one part of the body. He complains of headache very often and at times the pain is very severe.

The diagnosis is between malformation of the brain, cerebral or cerebellar neoplasm and hydrocephalus. An x-ray examination made by Dr. Leonard shows an unusual picture. The contour of the entire brain with its convolutions and fissures is distinctly seen. Dr. Leonard after much hesitation attributes it to a special thinness of the skull.

The nystagmus is in favor of a cerebellar condition, the epilepsy with headache and optic atrophy favor a cerebral condition. Against hydrocephalus speaks the small size of the head. The diagnosis is therefore uncertain. It must be added that a course of iodids improved somewhat the patient's condition.

Dr. William G. Spiller said he was glad to see Dr. Leonard's plates, and considered them a valuable contribution to neurology. Dr. Spiller has in his possession a calvarium from a case of hydrocephalus which shows exactly the condition represented by Dr. Leonard's plates, viz., atrophy of the inner portion of the calvarium corresponding to the convolutions of the brain. The skull of the boy presented had not enlarged very greatly, but the diagnosis between hydrocephalus and cerebellar tumor could readily be made by Dr. Leonard's plates. The atrophy of bone occurs where the convolutions exert long continued pressure.

Dr. H. H. Donaldson remarked that in the picture shown by Dr. Leonard the occipital bone appeared thicker than normal. He wished to know whether this was really the case, or whether the appearance was due to the nature of the photograph.

Dr. Leonard thought the bone rather thicker than normal.

Dr. Gordon said that when the boy first came under his observation he thought of malformation from the appearance of the head. The history of hydrocephalus he obtained later. The nystagmus of the child and the severe headache made him think of a cerebellar condition. He also thought of brain tumor and tried to investigate the localization of the convulsive seizures. According to the description of the father and mother they are generalized. The gait, station and reflexes are absolutely normal. He had considered the possibility of hydrocephalus. Optic atrophy may occur in hydrocephalus but the comparatively smallness of the head made him a little hesitating in regard to hydrocephalus. The diagnosis was between cerebellar disease, cerebral tumor, hydrocephalus and cerebral malformation. The senses of taste and smell were preserved.

A CASE OF BITEMPORAL HEMIANOPSIA FOLLOWED BY OPTIC ATROPHY OF TRAUMATIC ORIGIN

By Alfred Gordon, M.D.

In October, 1908, the patient fell off a wagon used to repair trolley wires. He lost consciousness. Sustained a fracture of both wrists and a linear fracture of the frontal bone according to the record of Mercy Hospital in Pittsburgh. No operation was performed on him. About three weeks later he began to see double. The diplopia lasted about two months. He then left the hospital with an impaired vision of both eyes, also ringing in the right ear with marked impairment of hearing on the same side.

He came under Dr. Gordon's observation in September, 1909, and the condition was found to be as follows: The face is asymmetrical, right side more elevated than the left. Tongue slightly deviated to the left. Grip good in both hands. Apart from exaggerated knee-jerks there are no abnormal reflexes. Sensations are well preserved. The station and gait are normal. The right ear is totally deaf. The eyes present interesting phenomena. There is a bitemporal hemianopsia and double optic atrophy (report of Dr. Ch. A. Oliver). The pupils are equal and react to light.

The patient complains not infrequently of headache in the frontal region. His memory is somewhat weakened. His disposition has also changed—is easily annoyed, is very irritable. The bitemporal hemianopsia indicates a lesion at the level of the median portion of the chiasma. Considering the total deafness of the right ear, which an examination of an aurist has shown to be normal, it is to be presumed that in addition to a fracture of the frontal bone the patient also sustained a fracture at the base, particularly of the sphenoidal bone, also of the petrous portion of the temporal bone, so that the chiasma and the eighth nerve became involved.

Dr. T. H. Weisenburg asked how Dr. Gordon explained the fact that this patient had optic atrophy on both sides and yet had bitemporal hemianopsia.

Dr. Gordon admitted that it was difficult to explain. Dr. Oliver simply made the statement after examining the patient's eyes a number of times, but offered no explanation.

A CASE OF ANOMALOUS MYOPATHY, WITH HEMOPHILIA AND JOINT INVOLVEMENT

By J. Torrance Rugh, M.D., and J. Hendrie Lloyd, M.D.

Patient was a young man 21 years of age whose family history was absolutely negative. Birth normal and no illness until four years of age, when he fractured the right elbow and considerable difficulty occurred in treating it, but a good result finally obtained. After recovery, the tendency to bleed was first noticed and his first joint swelling occurred at six years. Repeated attacks have involved the right knee, ankle, elbow, wrist and left knee and elbow, but once swelling and pain were present for as long as five months, but joints show no changes in structure, and only slight flexion of left knee. Has had repeated hemorrhages from nose and bowels and once from the kidneys. Has had excellent function of joints between attacks of swelling. At sixteen years had swelling and pain in calf of right leg and since then contraction of muscles until right foot is now in marked equinus varus, and left plantar contraction is also occurring. There is marked muscle atrophy in both legs, but little loss of power, absence of knee jerks but no disturbance of sensation. Clotting time of blood is somewhat delayed but tendency to bleed has practically disappeared.

The case is not one of hemophilic joints and does not present the symptoms of Schönlein's disease but the exact nature of the myopathy is obscure and the patient is presented for consultation.

Dr. D. J. McCarthy said that this case in its gross morphology resembled a case of prenatal myopathy, studied at the Philadelphia Hospital. It terminated fatally in the Phipps Institute. The joint condition was very much the same. There was marked club-foot on both sides, marked deformity of both knees, deformity of upper extremities, with practically congenital absence of muscular development. The patient could move around at first but later became bed-ridden. The case was carefully studied before death and there was an unquestioned history that the condition was present at birth, the mother was a patient in the Out-Patient Department of the Philadelphia Hospital and she was positive the condi-

tion had been present at birth. It was due to peripheral neuronie degeneration, evidently ante-natal, of the ganglion cells and cervical enlargement without, however, any cerebral involvement. The case presented, in its gross morphology resembles it very much. The atrophic condition of the patella, which is of very small size, together with the position of the condyles, would indicate a congenital condition, or certainly a condition developing in early infancy. The case resembles closely from the neurological point of view prenatal poliomyelitis.

Dr. Dercum said he remembered both the case reported by Dr. Lloyd many years ago and the relation of analogy to the present case and he remembered seeing it at the time in the Home for Crippled Children. There was a marked deficiency of development of the joint in that case rather than dystrophy. Dr. McCarthy's case he remembered, also, very well. That case differed from this case in the history in this case that the condition was not present at birth. It occurred to Dr. Dercum in looking at the boy and listening to the remarks, that we should remember that he had hemophilia and that he developed the joint trouble, and subsequently he had arthritic muscular atrophy, and that as secondary to disease of joint and as though the muscular involvement had not been primary in the case. Certainly that would seem to fit into the history somewhat better. The hemorrhage was in all the surfaces of the body, and was in the joints, and the atrophy of the muscles developed later. The atrophy of the muscles is secondary to and dependent upon the disease of the joints.

Dr. Gordon said that the involvement and flaccidity of the limbs, the loss of reflexes, flaccidity of joints from the hips down, reminded him of poliomyelitis. It occurred to him that since the patient is a bleeder (and he bled a number of times from the age of four), he might have had bleeding at a certain time in the anterior cornua of the spinal cord. The entire picture of the case is indeed one of anterior poliomyelitis. In regard to the treatment, he wondered whether Dr. Rugh had tried the calcium treatment for disturbance of clotting. It has been demonstrated that calcium has a certain effect on clotting.

Dr. G. E. Price considered the possibility of disturbance in secretion of the ductless glands as having something to do with the production of the symptoms. We know that cases with perverted function of the ductless glands may have free bleeding, especially from mucous membranes, and a change in the amount of calcium salts excreted.

Dr. Rugh said he wanted to thank the members for their very free expression of opinion regarding the case presented. In regard to treatment by calcium salts, the boy had had prior to coming under his care a thorough treatment with calcium salts, without any beneficial results so far as his bleeding was concerned. As to whether one may have an attack of prenatal poliomyelitis, with absolutely normal condition of the parts for a period of years and then the onset of symptoms which are not in any way related to them, he was not prepared to state. Remember, this boy's condition of deformity did not begin until he was sixteen years of age, and then the contraction which is to Dr. Rugh, together with the atrophy, one of the strongest evidences of the poliomyelitis, followed the inflammatory condition affecting the calf of his left leg. That was the only soft part which had been really involved in the inflammatory process. In regard to Dr. Price's suggestion as to the possibility of the influence of some of the ductless glands, Dr. Rugh's choice is towards a condition of that kind. Some years ago he had the misfortune (it proved so for the time, at least)

to operate upon a case of hemophilic joint in mistake for tubercular joint, and until he used thyroid extract he believed the man would die. He recovered and is to-day in perfect health and the joint conditions have entirely disappeared under its use. That is an experience which has been duplicated by a number of other observers. Dr. Rugh confessed his own feeling, in the absence of all joint changes shown in the skiagram and not capable of demonstration to the fingers in thickening of the joint membranes, that there is some definite alteration here which is due to involvement of some of the ductless glands.

Dr. D. J. McCarthy asked what Dr. Rugh considered the condition of the patella due to.

Dr. Rugh replied that it was a congenital condition. The patella is nearly three fourths of an inch in thickness, but the sulcus between the two condyles is extremely deep and at first glance Dr. Rugh thought the boy had no patella, but the patella is very nearly of normal size.

A CASE OF TOTAL OPHTHALMOPLEGIA AND BILATERAL FACIAL PALSY

By Augustus A. Eshner, M.D.

A tailor, 45 years old, complained of visual impairment, with diplopia, of eight days' standing, and pain in the orbits and all over the head and increased lachrimation, and he gave a history of exposure to draught four days earlier. The symptoms were worse at night, and sleep was disturbed. Vomiting had occurred on two occasions, and there were acid eructations after eating, with a bad taste in the mouth. The appetite was poor and the bowels were sluggish. Micturition was normal, and the action of the sphincters was unaffected. There were vertigo and a feeling of coldness. Gait and station were good, and the knee jerks were preserved. The eyes appeared prominent and staring. At times the upper lids were retracted, exposing the sclera above the cornea, while at other times they dropped in partial ptosis. The eyes could not be closed perfectly, and there was inability to elevate the brows. The act of frowning could be executed but feebly. Both eyes were turned inward, the right apparently the more at one examination and the left apparently the more at a subsequent examination. There was little power to rotate the eyes in any direction. The pupils were full and equal, a little excentric and the left a little irregular. Both reacted to light, and at the first examination they contracted in distant vision and dilated in near vision, while later no reaction could be observed in accommodation. The face was rather smooth. The patient was able to separate the lips but slightly to display the teeth, and unable to purse the lips in an attempt to whistle. Mastication was difficult from weakness of muscles moving the lower jaw, and the patient was compelled to use his fingers to dislodge food that accumulated in the cavity of the cheeks. Diplopia of simple character was present. Speech was difficult and articulation indistinct. Sensibility was preserved on the face. There was complaint of pain in the malar and submaxillary regions, and tenderness above and below the ears. Hearing was preserved. The grasp of the hands was moderately strong. The thyroid gland was not enlarged, nor was any other glandular enlargement present. The action of the heart was rhythmic, its sound clear. The pulse was small and 100. The urine

was free from albumin and sugar. The patient had had some febrile affection as a boy, and he had long been accustomed to drinking two small glasses of whisky daily. He denied all venereal infection.

Ocular examination by Dr. W. M. Sweet disclosed separation of the eyelids of between one fourth and one eighth inch on attempted closure. The left eye was found turned in in concomitant convergence, with the right eye fixing. The pupils reacted to light, direct and indirect and slightly in convergence. They were equal and measured 4.5 mm. in diameter. There was slight power of internal and external rotation. The sensibility of the right cornea was somewhat obtunded. In both eyes were opacities of the vitreous and also of the posterior pole of the lens. The discs were oval and slightly pale. There was some absorption of retinal pigment in each eye.

It seemed likely that the patient had some disease of the nuclei of the third, fourth, sixth and seventh nerves, perhaps infective in origin, but the rare possibility of a peripheral neuritis was considered. Mercuric chlorid, gr. 1/24, and potassium iodid, gr. x, were prescribed thrice daily, and after the lapse of several days the patient thought there had been some improvement, the pain in the face being less, double vision not so pronounced and ability to move the lips and to speak being increased. Headache still persisted and in sufficient degree to disturb sleep.

Dr. Lloyd thought the case looked like a case of polioencephalitis of Wernicke, involving the third, fourth, sixth and partially the seventh nerves. The mid-brain and the pons are undoubtedly involved, largely in the nuclear or gray matter. The fact that both the third nerves and the seventh nerves are only partially involved is also in favor of a nuclear lesion, as it is characteristic of such a lesion to impair the various neurons gradually, and not all at once. The case belongs to the type known as polioencephalitis superior. The Germans seem to think that alcoholism is an important cause of this affection, but other causes probably act; and the truth is, that we know little or nothing about the etiology.

Dr. Cadwalader said he had seen this case when it appeared in Dr. Spiller's clinic. According to the patient's own statement it seemed probable that he had had influenza at the time of the onset of the present condition. Dr. Spiller made the diagnosis of polioencephalitis superior and inferior.

Dr. Dercum thought that it might be more than a mere coincidence that there was infection in this class of cases, leading in adults to polioencephalitis and in children to poliomyelitis. It may be something suggestive. They are due to infection in all probability. Many of them have a febrile rise and general symptoms on their onset. May it not be that a similar infection takes place in the adult and nuclei yield that are less resistant?

Dr. Gordon remarked that the patient could wrinkle his forehead and twist his mouth, showing that he could contract the facial muscles pretty well; the facial nerve consequently presents now no evidence of involvement.

Dr. Spiller said that some years ago he had a patient who presented many of the symptoms of this patient and later presented signs of spinal cord involvement. It was probably a case of polioencephalitis associated with poliomyelitis.

Dr. Eshner thought one could scarcely escape the conclusion that

there has been some acute infection here. The man had been well previously, although he admitted addiction to two or three glasses of whiskey daily for twenty or thirty years. The acute onset and the general progress of the case point to infection. The symptoms appear not to be progressive, but rather retrogressive. There is no question that the seventh nerve was involved.

Dr. William G. Spiller read a paper on Conjugate Deviation of the Head and Eyes in Cerebellar Lesion.

Dr. T. H. Weisenburg stated that several years ago he showed either before this society or at Atlantic City before the Section on Neurology of the American Medical Association, a case in which there was a lesion limited to the dentate nucleus of one side, and in which clinically there was nystagmus to the side of the lesion and no other symptom nor conjugate deviation. The case was one of cerebrospinal syphilis.

Dr. Spiller said that nystagmus has been observed to be greater towards the side of the cerebellar lesion. This is not the same as conjugate deviation of the head and eyes.

A CASE OF TUMOR OF THE PONS WITH EXHIBITION OF THE SPECIMENS.

By John H. W. Rhein, M.D.

The tumor was evidently a glioma. The first symptoms were headache and vomiting, which symptoms, however, disappeared five months before death. Paresis of the right side of the face and left side of the tongue were the first localizing symptoms. Two months later gradually developing weakness of the left arm and leg was observed which progressed to complete paralysis. Two months before death paralysis of the right external rectus, indistinct speech and slight ptosis of both sides developed. From this time on the symptoms became more marked until there was complete paralysis of both sides of the body, complete anarthria, paralysis of both external recti muscles and loss of sensation in the distribution of the left fifth nerve. There was general slight spasticity. A few days before death there were a few convulsive attacks.

The tumor involved the entire pons and upper part of the medulla oblongata. The case was interesting on account of the unusual symptom complex, that is, right facial paralysis, paralysis of the left side of the tongue, and later paralysis of the right sixth nerve and loss of sensation on the right side of the face, and still later, left hemiplegia progressing to double hemiplegia with paralysis of the left sixth nerve, and finally paralysis of conjugate lateral and downward movements of the eyeballs.

A CASE OF CONGENITAL SPASTIC DIPLEGIA WITH ABSENCE OF DEMONSTRABLE LESION MICROSCOPICALLY OR MACROSCOPICALLY

By J. H. W. Rhein, M.D.

The patient, L. S., was admitted to the Philadelphia Home for incurables, May 12, 1895, and died October 26, 1909, at the age of 27.

Family history was lacking except that a brother and a sister were healthy. She stated, at the time of her admission, that she had been suffering from jerky movements as long as she could remember.

Examination made at the time by Dr. C. H. Burr, was as follows: There were constant involuntary movements, choreiform in character in arms and legs and face. Any attempt at voluntary effort increased movements. The movements are more intense on the left side. The left hand is in constant motion. The legs are rigid, especially the left, which cannot be extended beyond a right angle. There is distinct weakness in both left arm and leg. The grip in the right hand is much stronger than in the left. There is no palsy of the face. The tongue protrudes straight.

The knee jerk is increased on the right but cannot be developed on the left on account of rigidity. There is an attempt at ankle clonus on the right.

The pupils are equal and react to light. The speech is a little hesitating. She walks with distinct weakness in the left leg, the weight of the body coming down on the left toes. The patient is undersized and while the head is small it is not out of proportion to the rest of the body.

Autopsy showed nothing microscopically amiss. The weight of the brain after having been in formalin for about two weeks was one kilo and 167 grams.

Sections were made from the paracentral regions, from the pons, medulla and from the cervical, thoracic and lumbar regions of the cord. The pia in the paracentral regions was thickened and infiltrated with large mononuclear round cells, and connective tissue cells, the latter predominating. There was some perivascular distention and slight perivascular round cell infiltration in the cortex in this region. The Betz cells were numerous and stained well, and the other cells of the cortex could not be said to be diminished in number.

No pathological change could be found in the white matter of the pons, medulla or spinal cord, either by the Weigert method or with the nuclear stains. The pyramidal bundles in the pons were perhaps a little smaller on the right side than on the left, but otherwise no abnormality was noted.

The cells in the anterior horns of the spinal cord stained well and showed nothing abnormal except that in many there was considerable amount of yellow pigment.

In a word there was no demonstrable pathological condition to account for the spastic diplegia dating probably from birth or at least early infancy.

This case is interesting in connection with the case Dr. Rhein presented before this society last year in which histological study showed only a fineness of fibers of the crossed pyramidal tracts. He offered a possible explanation for the spastic paraplegia present in this case on the ground of imperfect conduction of motor impulses due to the fineness of the nerve fibers, just as wires of small calibre offer more resistance to the passage of electrical currents than wires of large calibre. Only a small number of cases has been reported in which there has been little or no demonstrable lesion of the cortex or pyramidal tracts in cases of spastic paralysis, namely those of Spiller, Rolly, Dejerine, Haushalter, Collins and those of his own.

These cases are extremely interesting and so far no very convincing explanation has been offered for the symptoms.

Dr. A. C. Buckley presented A Case of Associated Psychosis and Spinal Cord Disease.

Dr. Dercum said the case seemed to him strongly suggestive of specific disease, despite lack of any history. In keeping with that suggestion is the sluggishness of the action of the pupils. Impairment of the reaction of the pupils to light occurs in diabetes, paresis or cases of syphilis. Dr. Dercum does not believe that it occurs in other conditions.

THE PHILADELPHIA NEUROLOGICAL SOCIETY

April 22, 1910

The President, DR. H. H. DONALDSON, in the Chair

Dr. Edward Mercur Williams presented a Case of Family Spastic Paraplegia.

Dr. Allen remarked that the presence of a Babinski reflex on each side was a feature of the case worthy of note, as in looking over the literature in these cases of family spastic paraplegia the Babinski sign has been the one symptom frequently wanting. In a half dozen cases he has seen recently in literature not one presented a Babinski.

Dr. Spiller said the case was interesting because the man has such spasticity with comparatively little weakness. Dr. Spiller intended to have posterior lumbar and sacral roots cut.

Dr. Andrew H. Woods presented a Case of True Muscular Hypertrophy, with Diminished Power. Dr. Alfred Reginald Allen asked if Dr. Woods had noticed any quick exhaustion of the muscle on stimulation by the faradic current.

Dr. Woods replied that he had tried rapidly interrupted faradic stimulation for two minutes and after such stimulation the muscles responded almost as actively as at the beginning. The exhaustion after voluntary use was not rapid and immediate as in myasthenia gravis, but in walking weariness and staggering appeared after about half a mile.

Dr. Williams B. Cadwalader said that he understood in this case one of the sphincters was affected. In most of the cases of Thomsen's disease the sphincters have almost always escaped. He wondered whether in this case it could have been affected similarly with the muscles of the upper extremities.

Dr. Spiller said this case had interested him greatly and he had studied it carefully. It is not Thomsen's disease. There is not the electrical reaction of Thomsen's disease; there is not the difficulty in letting go of an object. The condition seems a true hypertrophy. There was no evidence of pseudo-hypertrophy under the microscope. Along with this great increase in muscle there is not the proportionate increase of strength, and Dr. Wood by diligent search has found several cases in the literature which bear distinctly on this subject. Dr. Spiller believed it to be a form of true hypertrophy of certain muscles, without corresponding increase of strength. There have been cases of hypertrophy of certain portions of the body reported, as of a part of a limb.

Dr. Alfred Gordon said that the chief manifestation in the case is the rapid exhaustion of individual muscles. Consequently taking the entire symptomatology of the case and the manner in which the exhaustion occurs—the man stated that as soon as he begins to work he begins to get exhausted—also the fact that the man has some difficulty

in swallowing, Dr. Gordon believes the case is analogous to myasthenia gravis. It is true that the distribution of the myasthenia is different in the latter from the present case, nevertheless the functional disability of the muscles is identical.

Dr. Charles K. Mills said that when he first saw the man he was inclined to look upon the case as an unusual one of pseudo-muscular dystrophy. Some points in the case still leave us in doubt. It is true one piece of muscle has been examined. Whether that in itself is sufficient to make the diagnosis of true hypertrophy applying to the man's whole musculature, he questioned. He has also what Dr. Mills noted at the time he first saw him, a bilateral atrophy of some of the muscles of the neck. The patient reminded him somewhat of a man he had seen many years before in this one particular of atrophy of the muscles of the neck. This atrophy ultimately extended to various parts of his body. Dr. Mills thought the undoubted atrophy which was present in some of the muscles of the neck should be accounted for before accepting absolutely the idea of a generalized true hypertrophy.

In arriving at a diagnosis difficulty in swallowing should also be taken into consideration. This probably has an organic basis which is not readily explained in the doctrine of the true hypertrophy.

Another point to which sufficient attention has not been called, is the condition represented by manipulations of the enlarged limbs. The massive looking arms are flabby and doughy to examination, much as the enlarged parts seem to be in case of pseudo-hypertrophy.

The diagnosis of myasthenia can hardly be borne out. The man may be however somewhat hysterical as men of his race are likely to be. It does not appear in reality a case in which weakenings are simply the result of exhaustion of a myasthenic character.

Dr. A. A. Eshner asked whether this case might not be considered one of exhaustion myasthenia. For many years the man had been engaged in arduous work, and the muscles had undergone hypertrophy, and perhaps as a result of overstrain a condition of weakness developed in these hypertrophied muscles. All of the symptoms, however, could not be explained in this way. It seemed, nevertheless, as if there might have been some exhaustion of the neuro-muscular apparatus.

Dr. Woods stated that the patient had been very much troubled with sleepiness during the day. He has gone over to the Christian Scientists but promises to return if they do not materially benefit him in the course of a few weeks. Aside from this no definite mental failure is to be noted.

Dr. Mills asked Dr. Woods how he explained the bilateral atrophy of the neck muscles in the light of the diagnosis of true generalized hypertrophy.

Dr. Woods replied that he had no explanation.

To Dr. Mills's objection that atrophy was presented in the left trapezius and possibly in the right trapezius, and that such atrophy pointed to a diagnosis of pseudohypertrophic dystrophy, Dr. Woods stated that the history says that when the patient was sixteen years old he had a paralysis of the left side. It might have been an anterior poliomyelitis, and the atrophy of one or both trapezii a result of that disease. He had not himself considered the right trapezius atrophied. Moreover, it is not possible to say that atrophy might not result from the disease (true

hypertrophy with weakness) which he suggested is found in this patient. If it is a distinct disease-complex, it has been so little studied that its course is not yet well understood.

Dr. William G. Spiller presented a paper on Gradually Developing Hemiplegia as Indicative of Brain Tumor.

Dr. C. S. Potts said he could add another case to the one Dr. Spiller had given, a case Dr. Mills also saw. He saw the man the first of March of this year. In the early part of December he had an attack pronounced by his physicians to be grippe and apparently from the symptoms described it was grippe, that is he had fever and general aches and pains. About the time he was supposed to be convalescing from this trouble he developed a spasm of the right arm and leg without loss of consciousness. In the course of a few hours he had a second attack; the next day he noticed weakness in this arm and leg. When Dr. Potts saw him he was able to walk and had increased reflexes. The eyes were perfectly normal. None of the general symptoms of tumor were present. Two days after Dr. Potts saw him for the first time he had another convulsion of the Jacksonian type and after that the weakness became considerably more pronounced. Dr. Potts had him admitted to the hospital after Dr. Mills saw him and advised operation. Two days before the operation was performed one morning he showed for the first time weakness of the right side of the face, the next day aphasia of motor type. He was operated on on the seventeenth of March. The cortex and the convolutions appeared perfectly normal. The man died from the effects of the operation, and at the autopsy a large sized tumor of a gliomatous nature was found. Dr. Potts also had a somewhat similar case in Blockley last summer—a colored man who had developed a progressive hemiplegia. He was a laborer. It was six weeks from the time he noticed weakness in the arm that he noticed weakness in the legs, and finally he became completely paralyzed on the one side. He was stuporous when he came to Blockley and died within a month of coming there. The tumor was an endothelioma. He had a number of Jacksonian attacks.

Dr. Mills said that of course gradually increasing hemiplegia is an old, almost classical sign in brain tumor. However, it is important to call specific attention to it because in a certain limited number of cases of tumor other active signs of the disease are absent. The diagnosis of brain tumor, however, cannot be made simply on the basis of a gradually increasing hemiplegia, unless various other affections were carefully excluded. In one case seen by him and also by Dr. Spiller there was a gradually increasing hemiplegia with other symptoms. The general symptoms of brain tumor were absent, although the ophthalmologist was a little doubtful at one of the examinations as to the exact condition of the disks but rather decided against the presence of papilledema. The operation showed a condition which Dr. Mills has seen in other cases diagnosticated as brain tumor.

These are cases of thrombosis, but merely calling them this does not entirely indicate their nature. They represent a clinical type in which the hemiplegia or other symptoms increase by steps, not strictly speaking by gradual accretion. They are due to the step by step closure of vessels which supply coterminous areas.

Besides these cases of thrombosis with softening and other changes which simulate brain tumor, other affections with progressively increasing hemiplegia, must be borne in mind—the unilateral ascending or the

unilateral descending paralysis, for instance, which has been especially described by Dr. Mills, and which is dependent upon the gradual spreading and degeneration of the pyramidal tracts.

One lesson to be drawn from a state of progressively increasing hemiplegia in relation to brain tumor is that of the importance of the study of their focal symptoms, such for instance, as Jacksonian epilepsy as in the case referred to by Dr. Potts.

Dr. J. H. W. Rhein said that the case of tumor of the pons he showed at the last meeting he thought was apropos in this connection. The patient had a gradually increasing hemiplegia which became finally total before death.

Dr. Spiller said that in a paper on brain tumor, published this year in the *Journal of the American Medical Association*, he tried to differentiate between these cases of slowly developing hemiplegia indicative of tumor and those indicative of thrombosis. In thrombosis there may be a steady increase of symptoms, and then a sudden onset of additional symptoms.

Dr. George E. Price read a paper on Myxo-sarcoma of the Right Frontal Lobe: Extensive Degeneration in Cord.

Dr. J. Hendrie Lloyd said in reference to the changes in the spinal cord they looked like changes we get in pernicious anemia. He was impressed with the possibility of its being toxic in origin. We have sometimes these diffuse sclerotic changes, and he thought possibly that has more to do with it than anything else. These patients are very anemic subjects; they have a secondary anemia.

Dr. G. E. Price in replying to Dr. Lloyd's reference to the probability of the changes in the cord being due to anemia, said that the anemic theory was one of those he did not discuss in the paper for the reason that it seemed so improbable. The blood had not been examined for anemia.

Dr. Price's recollection of the case was that the man was not anemic. He had bled profusely at the time of the operation, and that the spinal cord symptoms had developed a long time before the terminal stage—at least a year or more. In reply to Dr. Lloyd's referring to the similarity of the changes in the cord to those of pernicious anemia, Dr. Price said that while studying the sections, he had examined some specimens prepared by the late Dr. Pickett from a case of pernicious anemia and had noted the resemblance. He had also seen the same peripheral ring of degeneration in sections he had examined from another case of anemia.

Dr. Donaldson said that apropos of the condition of the cord, he had observed in demonstrating the spinal cord before classes, it was comparatively rare to find a cord in which the dorsal columns gave a satisfactory stain with the Weigert hematoxylin.

CIRCUMSCRIBED SPINAL SEROUS MENINGITIS. OPERATION AND RECOVERY

By T. H. Weisenburg, M.D., and George P. Müller, M.D.

Circumscribed spinal serous meningitis has only recently been described, the first case being by Schlesinger in 1898, who found such a condition postmortem. Since then successful operative cases have been described. In this country Spiller, Bliss, and Monroe described the only

reported cases. Victor Horsley in 1909 described 21 such cases. The case the speaker reports is as follows:

Girl, single, 20 years of age, with an excellent family history. Three years before she came under observation, while skating she fell on the right hip. She did not experience any discomfort until one year afterwards, when she began to have pain of an indefinite numb character over the right thigh. The severity of this increased, and pain extended over the right hip and buttock, and she had besides dull aching pain in the lower part of the back. About two years after she was hurt she began to be weak in her right limb and at this time the whole limb felt numb and tired, but the pains were especially localized over the thigh, where they were described as hot and burning or tingling. Examination at this time demonstrated a weakness in the right leg with increased reflexes but no Babinski, loss of sensation in the distribution of the eleventh and twelfth thoracic and first, second and third lumbar roots on the right side, with an indefinite loss of sensation over the rest of the limb. There was also soreness and tenderness over the tenth, eleventh and twelfth thoracic and all the lumbar vertebræ. Many examinations were made and in a subsequent examination, about a week after the first, there was noticed an absolute loss of sensation over the eleventh and twelfth thoracic and first, second and third lumbar roots on the left side and indefinite disturbance of sensation over the left leg. There was also an increase of reflexes on this side. Subsequent examination demonstrated a variance in the lateral and lower limits of the anesthesia but the upper limit was never disturbed. There was also, a week before the operation, an increased frequency in urination. A diagnosis of a tumor was made and the operation performed by Dr. George P. Müller and the eleventh and twelfth thoracic and first lumbar segments exposed. The dura was tense, bluish in color and there was a little pulsation. Incision into the dura exposed a large cyst of the pia arachnoid, which was full of fluid, it flowing out of the canal with great volume. The cord was slightly congested but otherwise normal. The patient made an uninterrupted recovery.

Examination several days after the operation demonstrated normal sensibility and repeated examinations since that time show a similar condition, and apparently the patient is just as well as ever. The reflexes are perhaps a little prompt.

All the reported cases have been diagnosed as tumor, but it is our opinion, however, that a differential diagnosis can be made, especially in such cases as the present, in which there was a large serous effusion, because we have here a variance in the limits of the anesthesia which is not presented in a tumor.

Of all the reported cases, this is the only one in which all the symptoms have disappeared immediately after the operation. This case is an excellent argument for early operations in those cases which present the symptoms of a spinal cord tumor.

Dr. Weisenburg stated that he was of the opinion that a clinical diagnosis of serous meningitis could be made with certainty, although Dr. Spiller thought differently. This is especially true in those cases in which there was an extensive effusion such as he reported, for there was in this case a variance in the limits of the anesthesia and to some extent in the reflexes, this not being present in tumor. Of course he recognized that in those cases of meningitis in which there was little effusion such a differential diagnosis could not be made. There is a tendency at the

present time to report all cases in which there is found an excess of cerebrospinal fluid as cases of circumscribed serous meningitis. It must be remembered, however, that in tumors or cysts, because of pressure on the cord, the fluid may be dammed up and when an incision is made this fluid is liberated, but these cases should not be called serous meningitis.

Dr. Spiller said he was extremely interested in this subject. The case Dr. Weisenburg reported was a brilliant one in its results. Dr. Spiller did not agree with him as to the ease of making the diagnosis. The symptoms of spinal cord tumor vary from time to time, and variation of symptoms is not a reliable sign in diagnosing circumscribed serous spinal meningitis. There may be an increase in pressure of fluid from time to time above a tumor.

Dr. Weisenburg said he certainly was obliged to Dr. Spiller for his statement concerning this group of cases and to hear him state that a positive clinical diagnosis was impossible. This patient when he examined her one day had loss of sensation in the first, second and third root distributions on the right side and when he examined her two weeks afterward she had a similar loss of sensation on the left side. There have been other cases reported of serous meningitis. In the March number of *Surgery, Gynecology and Obstetrics*, Munro, of Boston, has six cases of serous meningitis circumscribed of the cord.

Dr. Williams B. Cadwalader read a paper on Apoplecticiform Onset of Paralysis in Pott's Disease and its Pathology.

Dr. John H. W. Rhein read a paper on Paralysis in the Wild Animal.

A CASE WITH SYMPTOMS OF POLYNEURITIS. DEATH IN TEN DAYS. EXHIBITION OF THE BRAIN

By Alfred Gordon, M.D.

A young man of twenty began suddenly to complain of pain in the lower extremities. His previous health was good. Soon a weakness appeared in the same limbs, which gradually increased, and in five or six days the legs were totally paralyzed. The condition grew worse from day to day and death occurred on the tenth day. At autopsy there was a slight congestion of the base of the left lung. The brain on an antero-posterior transverse section showed a complete destruction of the left internal capsule and a partial destruction of the knee of the right internal capsule and of the externally adjacent brain tissue.

Great difficulty was experienced in explaining the clinical picture of the case by the pathological findings.

Dr. H. H. Donaldson asked whether the brain was entire when it was placed in the formalin.

Dr. Gordon replied that it was hardened in formalin a few days and then placed in Müller's fluid.

Dr. Alfred Reginald Allen inquired whether the corpus callosum had been cut on both sides, thereby opening the ventricular system before it was put in formalin. Dr. Gordon replied no. Dr. Allen asked whether he was to understand that the brain was put in entire, and then this condition was found. Dr. Gordon replied that it was as Dr. Allen had indicated.

Periscope

Archiv für Psychiatrie und Nervenkrankheiten

(Vol. 46. Part 1. 1909)

1. The Psychological Differential Diagnosis of Different Forms of Epilepsy. RITTERHAUS.
2. The Relations of the Vasomotor Neuroses to Functional Psychoses. ROSENFELD.
3. A Case of Coincident Disease of the Mind and of the Spinal Cord. BECKER.
4. Brain Abscess and Purulent Meningitis. RAIMIST.
5. The Pathological Development of the Central Nervous System. von LEONOWA-VON LANGE.
6. Mental Disturbances in Chorea. VIEDENZ.
7. The Experimental Basis of the Bromide Treatment of Epilepsy. WYSS AND ULRICH.
8. The Medico-legal Aspects of the Naval Service. MONKEMÖLLER.
9. The Physiology and Anatomy of the Mid-brain. ECONOMO AND KARPLUS.
10. The Value of Phase I (Globulin-Reaction) in Neurological Diagnosis. APELT.

1. (Continued article.)

2. *Vasomotor Neuroses*.—Rosenfeld has previously undertaken to prove that we are justified in bringing into etiological relationship certain nervous and mental symptom-complexes with the recognized vasomotor neuroses. In this article the attempt is made to carry this point of view further and to demonstrate that the vasomotor neuroses may play a general part in the etiology of mental symptoms, particularly in relation to certain recognized disorders of circulation. A case illustrative of this association is discussed at length and the general conclusion is reached that disturbances of circulation manifesting themselves as neuroses or otherwise should be studied and are of importance in relation to the production of mental symptoms. The work is an attempt to establish an etiology of a physical sort for certain types of psychoses.

3. *A Case of Coincident Diseases of the Mind and Spinal Cord*.—A case is described at length by Becker presenting both mental and physical symptoms. The patient was a woman suffering from the catatonic form of dementia præcox who also had a progressive spinal muscular atrophy with beginning bulbar paralysis possibly of the amyotrophic form. The paper offers little new.

4. *Brain Abscess and Purulent Meningitis*.—The question of the relation of brain abscess and septic meningitis is discussed by Raimist on the basis of three cases, one of left temporal abscess, the second of right cerebellar abscess, and the third of diffuse suppurative meningitis. Beyond the report of cases the paper is designed to show the difficulties of diagnosis

under certain conditions between these two affections. The opinions of Oppenheim are extensively quoted.

5. *Central Nervous System*.—This article is polemic in character and offers a second careful examination of a case of anencephalus combined with total absence of the spinal cord. Examination showed that in spite of the entire absence of ventral nerve roots the muscles showed no anomalies whatever, but were normal both in form and color. It was not possible to find any fat in the muscles and in general their absolutely normal character in view of total lack of nerve supply is a noteworthy but by no means previously unknown fact. It goes to show that the innervation of the voluntary muscles together with the so-called trophic influence of the ventral horn cells begins after embryonic life. A portion of the article is taken up with critical references to Neumann's work and to the work of the Gudden school.

6. *Mental Disturbances in Chorea*.—Five cases of chorea are described in this article, one having all the characteristics of the Sydenham type, occurring in a man of sixty-four. In all the cases certain mental disturbances occurred but only a considerable time after the onset of the chorea. No conclusions are to be drawn from so small a number of cases, nor did the mental disturbance have the same characteristics in the five patients observed. The opinion is ventured that the cases represent conditions of exhaustion psychosis, of which the existence of the chorea may be considered an indirect cause. Four of the patients were discharged cured, the fifth died and post-mortem showed an endocarditis.

7. *Bromide Treatment of Epilepsy*.—Wyss and Ulrich attempt in this article to bring into direct relation with practice certain theoretical considerations in the treatment of epilepsy. It has been found that in epileptics a diminution of chlorine in the blood hinders the onset of attacks. The question arises as to how great the diminution of chlorine must be to inhibit attacks. The writers attempt to answer this question on the basis both of experimental and clinical studies. In the treatment of the affection every effort must be made to avoid those conditions which markedly affect the chlorine. It is also essential to combat the definite physical conditions as they arise. In regard to the convulsion itself, it is necessary to provide for a diminution of chlorine with the least general effect upon the blood. It is undesirable to withdraw chlorine unnecessarily from the organism. The study of the amount of chlorine in the individual case is essential to successful treatment. The chemical details are stated and the exact relation of bromide therapy, in which they believe, to the main problem is discussed at length.

8. *Medico-Legal Aspects of Naval Service*.—(Continued article.)

9. *Physiology and Anatomy of the Mid-brain*.—(Continued article.)

10. *Neurological Diagnosis*.—In this paper Apelt discusses the so-called Phase I (Globulin reaction) in relation to the diagnosis of certain neurological conditions. The conclusions reached are in part as follows: Phase I assists in the diagnosis of incipient tabes and paresis on the one hand, and spinal or cerebral neurasthenia, with syphilis in the history, on the other. Phase I is as definite an early sign of paresis and tabes as lymphocytosis. The differential diagnosis between dementia paralytica and brain syphilis is not helped, nor is it certainly of value in differentiating between alcoholic pseudo-tabes and tabes. In general a positive Phase I and positive lymphocytosis should not permit an absolutely definite diagnosis of tabes or paresis.

E. W. TAYLOR (Boston).

Review of Neurology and Psychiatry

(Vol. VII, No. 9. September, 1909)

1. The Pathology of Dyschiria. Part II. (Concluded from No. 8.)

ERNEST JONES.

2. Neuronophagy. C. J. ROBERTSON MILNE.

1. *Pathology of Dyschiria*.—Quoting from the author's conclusions, dyschiria is a form of psychological disaggregation, of the variety characteristic of hysteria. It is primarily a defect in the synthesis of the feeling of "sidedness" (called in the article "Chirognostic feeling"). A patient who has dyschiria usually fluctuates between the conditions of anesthesia and allochiria. The latter, allochiria, is the only stable form of dyschiria. The anatomical hypotheses concerning allochiria are contradicted by all the facts bearing on the subject. Alloesthesia is an error in location due to a certain kind of hypoesthesia. Allochiria as originally defined by Obersteiner was not clearly separated from alloesthesia. Achiria is an amnesic failure of association between certain mental processes (concerning different bodily members) and the chirognostic feeling that normally is associated with them. Allochiria is achiria in which an abnormal association has been formed between these mental processes and the complementary chirognostic feeling. Sychiria is the coexistence of the normal and abnormal associations.

"The mental processes relating to a given part of the body are divided into: (a) the esthetic group of perceptions, and (b) the autosomatognostic group of memory feelings, of which chirognosis is one. When disaggregation implicates the second group, and the first is relatively or absolutely spared (a phenomenon referred to as "the paradoxical type of cleavage"), then achiria—or any other secondary dyschiric manifestation—results, and any sensation following stimulus of the part concerned shows the phrictopathic attributes previously described.

"When the paradoxical type of cleavage occurs, and return to the normal is prevented by the force of the repressed complex causing the disaggregation, then the autosomatognostic memories concerned can be recovered only at the expense of replacing their constituent chirognostic feeling by its complement. It is thus suggested that allochiria subserves the function of enabling certain autosomatognostic memories to be once more apprehended in consciousness, a consummation which is of marked benefit to the personal well-being of the patient. This teleological hypothesis of allochiria regards it as being akin to the transference phenomena of hysteria, in which one symptom is replaced by another less detrimental one.

"It is probable that all cases of dyschiria are primarily unilateral, but immediately pass permanently into one of the two classes, and show no subsequent tendency to change. It is tentatively suggested that the class chosen depends on the type of mind concerned: unilateral dyschiria will occur in pure hysteria, bilateral dyschiria in hysteria complicated by neurasthenia. The essential difference in the mechanism of unilateral and bilateral allochiria is that in the former the illusion of displacement of the part of the body in space is accessible to introspection, and thus involves a much grosser contradiction of previous experience than does the latter condition."

This interesting article should be read in its entirety to be thoroughly understood.

2. *Neuronophagy*, or the phagocytic destruction of nerve cells, is better termed *neuro-necrophagy*, and implies the process by which degenerated nerve cells are removed from the living organism. This process is a complicated one, and has not been worked out completely. The steps of the process are briefly as follows: Firstly, a stage of irritability of nerve cell and satellites due to some noxious agent which lowers the controlling nerve cell influence on the endothelial or connective tissue cells around it. The nerve cell begins to exhibit internal degenerative changes. The satellite cells increase in size and proliferate. Secondly, if destruction of the nerve cell becomes complete, certain proliferated (mesodermic) cells assume the role of phagocytes and are assisted by true phagocytic leucocytes attracted by the chemical changes resulting from decay of the nerve cell. Thirdly, these phagocytes penetrate and absorb the dead nerve cells. The spaces left after their absorption and disappearance are filled by cellular and fibrillary proliferation of the neuroglia tissue.

(Vol. VII. No. 10. October, 1909)

1. A Modern Conception of Dementia Præcox, with Five Illustrative Cases. C. MACFIE CAMPBELL.
2. A Case of Subcortical Hemorrhage Limited to the Post-central Gyrus. WALTER K. HUNTER.

1. *Dementia Præcox*.—For a useful classification, the entire evolution of mental disorders must be taken into consideration. Symptomatology alone is insufficient. Dementia præcox is best understood when a thorough analysis is made of the constitutional traits of the individual, of his habits in the widest sense of the term, and of the actual difficulties which have precipitated the onset of the psychosis. Jung has traced in detail some of the steps in the distortion of the patient's behavior and ideas. The writer inclines to Meyer's conception of the disorder rather than to Kraepelin's. This conception expresses the fact that the psychosis is the culmination of a long-continued period of unhealthy biological adjustments in individuals who constitutionally are apt to meet their difficulties in an inadequate manner. Kraepelin's hypothesis as to the pathogenesis of dementia præcox is based on the relations of the disease to the developmental period, to menstrual disorders, to the function of reproduction, to the climacteric, and is to the effect that in the absence of any recognized external cause, an auto-intoxication may exist which stands in some more or less distant connection with processes in the sexual glands. The writer considers this hypothesis as vague and worthless. The biological conception, on the other hand, he thinks, encourages the physician to a more practical therapy; and it is still more fruitful, he says, in the indications it furnishes for prophylaxis along educational and sociological lines. The same principles which have led to the above formulation of the nature of dementia præcox should also be applied in the study of the other psychoses.

2. *A Case of Subcortical Hemorrhage*.—The case confirms in a general way the view as to the sensory function of the post-central gyrus. The hemianesthesia present in the case was accompanied by a considerable

degree of hemiparèsis. The anesthesia and paresis were greatest in the left arm. The hemiparesis passed off mostly in about three weeks. A partial anesthesia of the left arm persisted for a longer period. The man died of an intercurrent affection. The autopsy showed vegetations and ulcerations of the mitral and aortic cusps and general septic peritonitis due to a ruptured appendix. A hemorrhage, subcortical and confined to the post-central convolution of the brain was discovered, mostly at the arm-center. No degenerated fibers were found in the motor pathway. The paresis was thought to be due to the presence of the hemorrhagic lesion "disturbing" the adjacent anterior central gyrus, either by direct pressure or otherwise.

C. E. ATWOOD (New York).

Journal de Psychologie, normale et pathologique

(Sixth Year, No. 6. November-December, 1909)

1. The Problems and the Method of Objective Psychology. W. BECHTEREW.
2. Periodic Psychosis—Mania. GILBERT BALLEET.

1. *The Problems and the Method of Objective Psychology*.—Bechterew complains that objective psychology, as he has outlined it in numerous articles, has been grossly misunderstood. As many of the devotees of the older psychology have been stirred to attribute to his theses a character so wholly different from what they ought to assume, he deems it expedient to reconsider both the purpose and the mode of procedure of this new science.

The purpose of this new science is to study the objective manifestations of all neuropsychic forms of activity while leaving rigidly alone the subjective investigation of those same phenomena.

Again, this new science employs a particular method to differentiate phenomena that are strictly and essentially psychic from those that exhibit only the more mechanical and reflex reactions of the organism, finally stating the former as pure reactions transmitted from one nervous center to another.

The foundation of an objective psychology lies wholly within the motor sphere. As by motility man comes into touch with the outside world and is constantly reacting to both favorable and unfavorable influences, we may regard the motor sphere as playing the principal role in this psychology. Motion is the apparatus of relation par excellence. From the viewpoint of objective psychology, psychic phenomena do not differ from the simple and ordinary nervous processes but in being of a higher degree of complexity. The real distinction between neuropsychic acts and the simple reflexes is that the latter always portray functions that are inherited or innate to the organism, such functions being the result of the experiences of the past generations; whereas the neuropsychic acts represent reactions springing out of the personal experiences of the individual.

After illustrating at considerable length some of the laboratory methods employed in the objective study of psychology, the author pronounces a decisive affirmative to the question as to whether objective psychology may be considered as an independent and autonomous science.

He concludes that objective psychology, unlike subjectivism which created for us the notion of free-will with all its attendant evils in the way of mediaeval tortures and punishments, promises to conduct us to a knowledge of man in uncovering for us the inherited mechanism which unites the animal instincts with the new aspirations toward truth, justice and beauty.

2. *Periodic Psychosis—Mania.*—By mania Ballet understands a pathological mental state revealed by three essential symptoms, namely, psychomotor agitation, flights of ideas, and euphoria or sense of well-being. When this syndrome appears with extreme intensity, we may speak of the mania as acute; when the intensity is less, it is recognized as maniacal excitement or hypomania. Among the subsidiary or less important characteristics of mania the author mentions:

1. That the maniac does not regard himself in any way as being in the midst of strange surroundings. This fact is highly important in the differentiation of mania from dementia præcox.

2. That the maniacs are never disoriented, or if so only for an instant at the height of their extreme agitation. This trait differentiates mania from mental confusion.

3. That the euphoria, optimism and self-satisfaction of mania is endowed with a peculiar feature. While the euphoria of general paresis implicates in its beneficent atmosphere everything and everybody, it is quite the reverse with the euphoria of mania. Maniacs are gay but ironically so; they are optimistic in regard to themselves but sarcastic and malevolent with regard to others.

4. That maniacs are not troubled with hallucinations or very slightly so; and when they do occur, the hallucinations are of the nature of episodic accidents and not direct events in the course of the disease.

5. That maniacs do not generally show any use of temperature. The rest of the article is taken up with a discussion, illustrated by cases, of the differentiation of mania from mental confusion, hebephrenic agitation (dementia præcox), acute alcoholic delirium, epileptic "mania," and general paresis.

METTLER (Chicago)

Revue Neurologique

(Vol. XVII. No. 24. December 30, 1909)

Discussion of the Paris Neurological Society and Paris Psychiatric Society on "The Part Played by Emotion in the Causation of Neuropathic and Psychopathic Disturbances."

Janet proposed the following definition for emotion "in circumstances for which the individual is not adapted by his previous organization and to which, for any reason whatever, he is not capable of adapting himself: when he perceives these circumstances and is aware of the necessity of reacting to them. In such an event one observes, in place of a useful reaction, a series of disturbances in all the functions of the organism and this group of disturbances comprises the condition which it is proposed to designate by the term emotion. The symptoms which are considered as emotional are: Modifications of sentiments, such as anger, chagrin, indignation, etc.; intellectual agitation such as the appearance of an hallucination or a fixed idea or a multitude of ideas and memories without much

respect to the circumstances, the apparent hyperamnesia of individuals in danger of death for instance; intellectual degradation, either systematized, such as systematized amnesias, or diffuse, with retraction of the field of consciousness; disturbances in attention, doubts, and difficulty in the perception of time and objects. Visceral disturbances may be either systematized or diffuse agitations such as spasms, polydipsia, vomiting, palpitation of the heart, vaso-constriction, etc., or depressions such as visceral atonias, constipation, vaso dilatation, and the modification of nutrition, etc. Motor disturbances such as tics, grimaces, exclamations, or depression with incapacity to execute correctly an action, tremors, etc. Janet discusses briefly the various theories of the emotions: the sentimental (Dugald-Stuart), the intellectual (Herbert), visceral (Lange; James), instinctive (Stanly Hall; Dewey), and compares them with the dynamic theory. Hallion discusses the physiologic problems connected with the emotions particularly the influence of the intensity of the emotional shock on its effects, also the influence of the quality of the emotions, the incoordination of emotional reactions, the influence of the volition on emotional reactions and the psychic effects of emotional reactions. Neurologic problems of the emotions are discussed by Henri Claude who believes that they are a large factor in the causation of neurologic conditions but are subordinate to the state of emotivity of the subject which is defined as "the manner of perception and expression of the emotions" and which is inherited though it may be modified by repetition of emotions. Emotion does not cause epilepsy but may provoke attacks of their equivalents. It does not cause hysteria but it is capable of producing hysterical manifestations in a subject whose emotivity is previously hysterical. The emotions which cause depressions in normal subjects are capable of causing the diverse manifestations of the state called neurasthenic but in all chronic cases of neurasthenia the emotions must have acted on the ground of a constitutional debility, an hereditary degeneration either psychic or physical. Emotions may cause certain choreiform troubles and myoclonias but not the chorea of Sydenham. Emotions exaggerate the tics but do not cause them; they are stigmata of degeneration. Emotions may be the cause of a certain ill defined class of cases which consist of a permanent exaltation of the emotivity. They are usually the result of traumatism and are states essentially emotional which are grouped under the title traumatic neuroses. Ernest Dupré in discussing the psychiatric problems divides emotions into two classes, the expansive or agreeable and the depressive or painful. All emotions are psychic shocks. Subjects vary greatly in reaction to these psychic shocks; some are very unstable and this pathologic emotivity, the nervousness of the older writer's, is a form of psychic disequilibrium which is usually hereditary and associated with other tares of degeneracy. The psychic anomalies are frequently associated with anomalies in sensation, motion and nutrition. There is usually not only an increased sensibility but a decreased inhibition. The pathologic manifestations of the emotional constitution are the anxieties, phobias, and sexual perversions, and they are equally the basis of manic depressive psychosis. Emotion plays an important part in the etiology of traumatic psychoses. In systematized psychoses and chronic hallucinatory states emotion has no etiologic action. In organic psychopathies emotion plays a part which is secondary and indirect. In psychopathies due to arrest of cerebral development one

observes some idiots and imbeciles who are incapable of emotion; others are extremely emotional and liable, under the influence of emotion, to develop various neuro-psychopathic states. The early stages of dementia præcox are frequently characterized by an apathy and absence of emotion. Finally, emotions may produce effects on a fetus in utero. The societies discussed the above questions in detail, the chief argument being over the question of the influence of emotion in the hysteria. Babinski defended his position that the manifestations of hysteria are the result of suggestion.

(Vol. XVII, No. 25. Supplement)

Contains the indices for volume seventeen: The list of original communications; the programs for 1909 of the Paris Neurological Society and the Paris Psychiatric Society, the proceedings of which were reported in the *Revue*. Also the abstracts which have appeared in the *Revue* are indexed both by subjects and by author's names.

(Vol. XVIII. No. 1. Jan. 15, 1910)

1. Juvenile Spasticity and Astereognosis. G. GUILLAIN AND G. LAROCHE.
2. On the Frequent Absence of Permanent Contracture in Infantile Hemiplegia. E. LONG.

1. *Spasticity and Astereognosis*.—A boy aged 19 years, perfectly well until the age of 18, developed suddenly and while in good health, a tingling and numbness in the hands and one foot. The tingling lasted about two weeks and left him with a complete astereognosis in both hands. There was no loss of superficial sensibility, but the osseous sensibility was lost in both hands and there was a loss of the sense of position in the fingers. There was slight weakness in extension of the wrists but none elsewhere. The gait was slightly stiff but not spastic, ataxic or cerebellar. The tendon reflexes were exaggerated and there was a patellar and ankle clonus. Babinski's reflex was present on both sides, the cremasteric reflexes were normal but the abdominal reflexes were absent. Nothing was known of the family history as the boy was a foundling. The author discusses the possibility of hysteria, hereditary cerebellar ataxia, multiple sclerosis, hereditary syphilis, etc., and concludes that the affection is due to cerebral lesion of unknown nature. Inasmuch as the author can find no similar cases recorded in the literature, he proposes the name given in the above title.

2. *Absence of Contracture in Infantile Hemiplegia*.—Attention is called to the frequency of cases of infantile hemiplegia in which there are no contractures on the paralyzed side, either permanent or latent. In some cases there is a hypotonia which may co-exist with exaggerated tendon reflexes and a Babinski reflex on the same side.

(Vol. XVIII. No. 2. Jan. 30, 1910)

1. Double Ocular Hemiplegia (Abolition of all Voluntary Movements with Conservation of the Sensorial Reflex Movements). ROUX.
2. The Relaxation of the Muscles in Organic Hemiplegia. NOÏCA AND V. DUMITRESEN.

1. *Double Ocular Hemiplegia*.—A case of pseudo-bulbar palsy probably due to lesions in both lenticular nuclei. The eyeballs and lids were completely immobile when attempting to execute a command voluntarily to

move the eyes, but would move freely in all directions as a result of some sensory impression. They would not move for a determined sense impression, such as the placing of objects in the field of vision. A loud noise produced no movement. A bright light brought suddenly before the eyes would cause winking, but not the hand or other objects. Binocular fixation was normal, as were also the pupillary reflexes. The author regards the case as one of complete destruction of the cortical centers for voluntary movements of the eyeball in the foot of the second frontal convolution. The reflex movements were preserved because controlled by centers in the posterior lobes.

2. *Relaxation of Muscles in Organic Hemiplegia.*—The author concludes that in cases of hemiplegia with exaggerated tendon reflexes and with a certain degree of contracture, when the angle of the flexion of the forearm can be made very small it is not due to hypotonicity of the muscles, but is due to lesions in the muscles, these lesions implying little or no contracture of the triceps. On the contrary when the angle is greater it is because the muscular lesions are less marked and the contracture of all the muscles is greater, including the triceps.

(Vol. XVIII. No. 3. Feb. 15, 1910)

1. Obstinate Vomiting of Pregnancy and Its Relations to Lesions of the Nervous System. H. DUFOUR AND P. COTTENOT.
2. Motor Aphasia, Coexisting With the Sign of Lichtheim-Dejerine and Paraphasia in Writing. Latent Trouble in Intelligence. J. FROMENT AND P. MAZEL.

1. *Vomiting of Pregnancy and Lesions in the Nervous System.*—In some cases a complicating tabes may be the cause of the vomiting. In the cases reported the tabes was latent, the vomiting being the first symptom. In a number of cases pregnancy is apparently the cause of multiple neuritis and the vomiting is due to neuritis of the pneumogastric. In these cases the vomiting is an early symptom, the manifestations of the peripheral neuritis appearing later.

2. *Motor Aphasia.*—Clinical observation on a man 27 years of age, who was a very heavy drinker. He was struck with a knife on the right side of the head and about an hour later became delirious. The next day he had lost the faculty of speech without any paralysis or any change in the tendon reflexes. The speech was regained to some extent but the vocabulary was limited and there was difficulty in naming objects. The author concludes that the case did not correspond to a "pure motor aphasia" nor to an "aphasia of Broca," but is of an intermediate type. The defect in intelligence was due to a defect in the faculty of attention.

C. D. CAMP (Ann Arbor).

Nouvelle Iconographie de la Salpêtrière

(XXII. No. 1. Aug. 8, 1909)

1. Osteitis Deformans, the Pathogeny of Paget's Disease of the Bones. KLIPPEL AND WEIL.
2. A Comparative Radiographic Study of Some Dystrophic Affections of the Bones. LEGROS AND LERI.
3. Spontaneous Fracture of the Patella in a Tabetic. GAUTHIER.
4. Goitre and Scoliosis of Adolescence. PARHON AND JIANO.

5. Chronic Anterior Poliomyelitis of the Cervical Cord. Bilateral Symmetrical Involvement of the Bulbar and Spinal Nuclei of the Eleventh Cranial Nerves. BERTOLOTTI.
6. A Study of the Professional Spasms. LEPINAY. (Continued article.)
7. The Insane in Art. MEIGE.

1. *Osteitis Deformans*.—Description of the case of a woman of 56 years of age who presented the characteristic changes of osteitis deformans, particularly on the right side, an "unipaget" the authors call her. The enlargement affected chiefly the right leg, the right side of the pelvis, the vertebral column and the bones of the right hand. The deformity was most apparent in the lower extremity, the right leg being enormously thickened and greatly bowed and there was marked scoliosis of the vertebral column extending from the seventh cervical to the fifth dorsal vertebra, so that the height of the patient had considerably diminished. The left leg, while not bowed, also appeared somewhat thickened and the patient presented the appearance of being made up of two asymmetrical halves, the upper small and delicate, the lower thick and heavy. A curious feature of the case was that the right leg presented a surface temperature five degrees higher than the left. No definite etiological factor could be discovered in the case, the patient not even being able to definitely trace the beginning of the disease and having sought treatment not for the bone trouble but for dyspnea and cardiac palpitation, apparently due to valvular disease. Four years before coming under observation she had had an apoplectic attack, but had recovered from this without other defect than some loss of memory. The authors discuss at some length the various theories as to the pathogeny of Paget's disease, which attribute it respectively to a syphilitic, a trophoneurotic and a vascular origin. The view which would attribute the changes to sclerosis of the nutrient arteries of the affected bones seem to them to offer the greatest probability, but they find this by no means satisfactory and conclude that the question of the pathology of osteitis deformans is as yet unsettled. Their article is illustrated by the fine plates customarily introduced in this journal.

2. *Some Dystrophic Affections of the Bones*.—The authors conceived the idea of studying by means of X-ray pictures the changes found in the bones in some of the dystrophic affections in an endeavor to ascertain if a basis could not be gained for the intra vitam diagnosis between these often puzzling conditions. The present plates illustrating the results obtained from such a study of bones from the collection in the Dupuytren museum preserved as specimens of Paget's disease, bone syphilis, osteomalacia and rickets, with descriptive text. In a general way in bone disease the two factors of rarifying and condensing osteitis are associated in varying proportions. In the bones examined the authors found that these processes were distributed in a different way, according to the disease present, the appearance in the skiagram being entirely different. In Paget's disease in particular the interior of the bone shows a peculiar arrangement resembling cotton wool which presents quite a different appearance from the alveolar aspect of osteomalacia and again from the hyperostoses and exostoses of syphilis and from the incurvation and localized thickening of rickets. These differences, which are well brought out in the accompanying plates, the authors think may be useful as aids to diagnosis in some of the obscure cases met with.

3. *Spontaneous Fracture of the Patella in a Tabetic*.—A woman of 57 years of age, who had had seven children, no miscarriages, at about the

age of 40 had a cutaneous eruption and some swelling of the labia. At about 51 or 52 she had the first symptoms of tabes in the form of gastric crises, and later lightning pains and diplopia. Later there appeared laryngeal crises, sensory disturbances, disturbances of the bladder function and ataxia. Two years before her admission to the hospital, while attempting to lift a sack of wood to her shoulder, she suddenly fell and was unable to rise. For three months she could not walk. At no time was the slightest pain experienced. The disease now made rapid progress and upon her entry into the hospital characteristic symptoms of locomotor ataxia were present and the author discovered that she had an ununited fracture of the left patella, the fragments being separated about four finger breadths. At the death of the patient, after a sojourn of 22 months in the hospital, an autopsy disclosed characteristic sclerosis of the posterior columns of the cord, lesion of the aortic valves, pleurisy and pneumonic consolidation upon the left side and contracted kidneys. The cavity of the left knee joint was enlarged, its synovial membrane thickened and it contained a quantity of synovial fluid.

4. *Goitre and Scoliosis of Adolescence*.—Description of the case of a young woman of 24 years of age, coming from a district in Roumania in which goitre is not prevalent, who presented an enormous cystic goitre, with a marked scoliosis, the former having preceded the latter by about a year. The authors practiced a partial extirpation of the struma, but fail to state to what extent the condition of the patient was ameliorated after the operation. They make this case the occasion for a discussion as to the relationship between diseases of the thyroid and affections of the bones, and express the opinion that scoliosis may be due to a sort of osteomalacia of the vertebral column, which they think may stand in relationship to faulty metabolism of the calcium salt and phosphates. That the thyroid gland plays a rôle in the metabolism of lime salts there is considerable evidence. In the case reported the proportion of quantities of urea, phosphoric acid and calcium fell quite considerably after the removal of the goitre. That scoliosis may also depend to some extent upon insufficiency in function of some of the other glands furnishing an internal secretion, the authors think quite probable. It is certainly far more common in females, as is also thyroid disease and in some of the cases the sexual development has seemed subnormal. Deformities of the vertebræ have also been observed in gigantism in which thyroid hypertrophy is frequent. Thyroid hypertrophy and vertebral deformity have in some cases been found to occur with senile osteomalacia and one of the authors has observed thyroid hypertrophy twice in three cases of senile osteomalacia. Histological examination of pieces of the gland removed in the case reported showed sclerosis and deficiency in colloid.

5. *Chronic Anterior Poliomyelitis*.—A woman of 25 years of age, previously healthy, during her second pregnancy felt frequently a sense of fatigue, tired easily and noticed some change in gait. One month after delivery, having returned to her accustomed occupations and while assisting her husband, a farmer, she attempted to carry on her shoulder a sack of wheat. She suddenly gave way and could not support her burden. She remained in bed several days, having no fever or other special symptoms except some pain and a difficulty in holding her head erect and in moving it laterally. Returning to work after this time her disability gradually increased and there developed functional insufficiency of the muscles of the soft palate and of the larynx.

Clinical examination demonstrated atrophy of the trapezius, the sternomastoid, all the cervical muscles and the posterior muscles of the shoulders. In addition to this there was bilateral paralysis of the adductors of the larynx and paresis of the muscle of the soft palate. Electrical examination showed degenerative reactions in the muscles supplied by the spinal accessory and by the upper cervical nerves. There was no sensory abnormality. The atrophy of the neck muscles caused the patient to balance her head with the chin slightly elevated, and if the head was displaced forward it fell, the chin impinging upon the chest. Viewed from the side the neck presented the appearance of that of a goose, being elongated and thin abnormally. There was unusual prominence of the seventh cervical dorsal kyphosis, and upon palpation at the back of the throat there was an unusual prominence which had led to the diagnosis of fracture luxation of the third or fourth cervical vertebra, and on this account the patient had been sent to St. Johns Hospital, Turin, for an X-ray examination. This being made showed no displacement of the bones.

Discussing the nature of the case the author makes by exclusion a diagnosis of chronic poliomyelitis anterior of the spinal accessory and some of the upper cervical nuclei.

This case furnishes strong evidence as to the part which the accessorius takes in the innervation of the muscles of the larynx and of the soft palate, by way of the anastomosis which its internal branch makes with the ganglionic plexus of the vagus.

7. *The Insane in Art*.—A consideration of the portrayal of insane conditions as it is found in the works of the great artists, with a review of "I Pazzi nell'arte," published by Portigliotti in 1907, and a disquisition upon the newer views with regard to hysteria, of which disease the author acknowledges he made somewhat too free use in his attempt to explain the conceptions contained in certain of the great works of art in a communication published about fifteen years ago. As illustrations there are reproduced the "Stultitia" of Giotto (from a fresco in the chapel of the Madonna dell'Arena in Padua) and "Fury" or "The Lost Soul" from a drawing of Michael Angelo.

(XXII. No. 2. 1909)

1. The Action of Radium Upon the Central Nervous System. ALEQUIER AND FAURE-BEAULIEU.
2. Contribution to the Study of the Peduncular Syndrome. A Case of Left Hemiplegia with Total Bilateral Ophthalmoplegia. ROSIN.
3. Three Observations of Spasmodic Laughing and Crying in Right Hemiplegies. VIRES AND ANGLADE.
4. Spasm of Articulation with Facial Hemispasm and Bilateral Spasm of the Muscles of the Neck and of the Scapular Girdle. RIMBAUD AND ANGLADE.
5. A New Case of Achondroplasia. LEVI.
6. Essay on the Physiology of the Mind. LEFÈVRE.
7. Study of Professional Cramps. LÉPINAY. (Continued article.)
8. A Medico-Artistic Document Upon Achondroplasia. LEVI.

1. *The Action of Radium Upon the Central Nervous System*.—Referring to certain experiments of Scholz and of Obersteiner in exposing the

nervous system in rabbits and mice to the action of radium inserted under the skin over the spine and next the cranium, as a result of which severe paralytic phenomena followed by death ensued and in which upon autopsy there were found hemorrhages, softening and round cell infiltration, the authors were struck by the disproportion between these results and those observed after the therapeutic application of the metal. Attributing this discrepancy to high dose and prolonged exposure, combined with feebleness of the test animals, the authors were led to try the effect of 0.025 gm. of radium of an activity of 500,000. In one case this was enclosed in lead foil 0.1 millimeter thick, covered with a layer of rubber, which was applied over the cranium. In another case application was made over the spine, the radium being covered by a layer of lead 0.2 millimeter thick. This thickness of lead "arrests all the α -rays, almost all the β -rays and the fraction of the γ -rays whose power of penetration corresponds to the ordinary X-rays, and only lets through the minority of the β -rays and the fraction of the γ -rays whose power of penetration is superior to that of the greater part of the ordinary X-rays." Adult rabbits were used and were not restrained but left free in their cages. The applications were respectively: (1) Applied over the head for 60 hours during 4 days, the animal killed after 9 days; (2) applied over the head for 60 hours during 7 days, animal killed after 50 days; (3) applied over the spine for 130 hours during 36 days, the animal killed after 32 days. None of the animals showed any disturbance of general health or any nervous symptoms. The post-mortem examinations showed some slight changes in the skin and in the bones. In the nervous system the only abnormalities found were some small hemorrhages of microscopical size occurring between the cortex and the pia mater and in both gray and white matter, and infiltration within the sheaths of the small vessels. The nervous tissues proper showed nothing abnormal.

In the third experiment the hemorrhages were somewhat larger, though still very small, were limited to the gray matter and corresponded to the region exposed to the radium emanations.

2. *The Peduncular Syndrome*.—A peasant woman 31 years old, the mother of nine children, in whose previous history nothing of importance appeared, suddenly had a stroke of apoplexy and according to the report of the family became unable to move the limbs on the right side or to raise her eyelids. An accurate history during the time prior to her coming under the author's care three months later is, however, wanting. Upon examination after her entry into the hospital she presented a paralysis of all the muscles of both eyes except the external recti, showing ptosis, external strabismus, immobility of the pupils to light and to accommodation. There was also paresis of face, arm and leg of the left side, with a moderate degree of contracture, the patient walking with characteristic hemiplegic gait. There were exaggerated reflexes in both upper and lower extremities of this side, Babinski, and upon tapping over the coracoid process there was produced a contraction of the muscles of the entire left arm. There was also hypoesthesia of the whole left side and the affected muscles were diminished in volume as compared with those of the right side, the left hand showing the characteristic appearance found in muscular atrophy of the Aran-Duchenne type ("ape hand").

Discussing the localization of the lesion producing these symptoms, the author thinks that it is one affecting at the same time the nuclei of both oculo-motor nerves, the left sensory tract and the right pyramidal tract,

hence must be situated in the superior peduncular region affecting the region below the posterior part of the floor of the third ventricle and the anterior portion of the aqueduct of Sylvius, extending specially to the right so as to impinge upon the motor and sensory tracts on this side (above the decussation). The pathological process was most likely a hemorrhage.

3. *Spasmodic Laughing and Crying in Right Hemiplegics*.—(1) Man, 66 years old, arteriosclerotic, complete right hemiplegia followed three months later by crises of spasmodic weeping. There was no disturbance of sensibility, no tremor, no contraction, paralysis of eye muscles, or disturbance of deglutition or ptialism. Speech was a little slow but perfect, the patient comprehended everything said to him and there was no mental disturbance. The crises occurred very frequently but were of short duration and consisted in spasmodic muscular contractions of the character which usually accompany weeping, though most frequently there was no actual shedding of tears. A paroxysm could be provoked by the idea of something sad or by an emotion, but it more usually occurred spontaneously, and both before and after the attack there was no real sadness.

(2) Man of 53 years, stroke followed by right hemiplegia. A few days later he showed some speech difficulty. Besides the usual symptoms of hemiplegia he presented marked troubles of articulation. Speech was slow, the same word would be repeated and the patient stammered. There was notable slowness in ideation and some verbal aphasia but neither word deafness, word blindness nor agraphia. No sensory disturbance. There were intermittent accesses of spasmodic laughing and weeping. These were rarely spontaneous but usually were provoked by an intellectual effort, a question to which he could not reply or any contradiction. Even gazing fixedly into the patient's eyes would at times produce a crisis. Laughing predominated. Once started, the crises would repeat themselves for hours, growing continually more violent. The patient would present a pitiable, astonished appearance, then would throw his head back and laugh violently and tumultuously until exhausted. He would try to cut short the paroxysms but unavailingly. At times there were manifestations of sadness accompanied by irrepressible weeping interspersed with spasmodic laughter. No therapeutic measures availed in checking these crises.

(3) Man 66 years old, stroke preceded by vertigo and tinnitus aurium. One year later spasmodic crises of weeping appeared. Typical right hemiplegia without ocular paralysis, sphincter involvement, trophic troubles, weakness of the tongue muscles, ptialism or sensory trouble.

The patient talked precisely, without stumbling and without repetition. The tone of his voice was monotonous, sing song and slightly scanning. There was some paralysis of the palate muscles and attempts at swallowing frequently led to spasms of coughing. The spasmodic crises were not very frequent and rarely spontaneous but usually provoked by some sad thought, an affecting paragraph or some annoyance. They consisted of weeping spasms in which tears were shed profusely. There was no consecutive sadness but supreme indifference.

In connection with these cases the authors discuss the views of various authors as to the causation of such crises. The consensus of opinion seems to be that the thalamus is the center for the reflex acts concerned in the expression of the emotions, responding to excitations, but normally under the control of the cortical association neurones. If this inhibitory influence is removed the reflex action is irregular and subject to the smallest irritations proceeding to the phenomena of spasm of

the mimic muscles. The anatomical lesion producing the trouble may be cortical, central, unilateral or bilateral and may affect the thalamus itself or the internal capsule or both; in either case cutting off the inhibitory influence.

4. *Spasm of Articulation with Facial Hemispasm, etc.*—Report of the case of a man of 31 years of age who presented this peculiar combination of symptoms. The family and personal histories presented nothing abnormal. The spasm began at the age of 22 years and has continued uninfluenced by treatment. The patient can speak clearly some phrases upon first waking in the morning, but the spasm soon sets in and only by great effort can he bring out a word, speech appearing to be arrested as by a constriction of the glottis. When he gets angry his voice becomes normal, the spasm returning when his good nature returns. He also has some difficulty in mastication, and there is some trouble in drinking but deglutition proper is not impaired and fluids never regurgitate from his mouth. Laryngoscopic examination showed some congestion of the cords, with spasm upon phonation and cadaveric position in respiration. Nothing else abnormal. The authors regard the trouble as a localized spasm not as tic.

5. *Achondroplasia*.—Description of a Tuscan dwarf 115 cm. in height, with measurements and photographs. As in other similar cases this subject is characterized by a trunk of almost normal size, by extreme shortness of the extremities and by an enormous head.

Other, noteworthy peculiarities are—abnormal shortness of the fourth metacarpal and fourth metatarsal bones, relatively greater shortening of the tibia than of the fibula and of the ulnar than of the radius, flattening of the skull in the occipital region and marked prognathism. The X-ray pictures show the enlargement of the epiphyses and the shortening of the diaphyses. The skin of the hands seems to be in excess and there is an interdigital membrane nearly a centimeter wide. Urinary examination shows an excess of ethereal sulphates, otherwise the examination of secretions gives evidence of nothing abnormal. The intelligence of this dwarf is good for one of his position and education, but he is a shameless liar and malicious. Sexual power is normal but he is not addicted to libertinism and is extremely sensitive to ridicule. While achondroplasia is apparently due to a sclerosis of the epiphysial cartilages ante partum, the exciting agent of this process is not certainly made out. That it is due to syphilis is negatived in this case, in the author's opinion, by failure to secure a reaction to the Wassermann test. He does not think that it has so far been able to be connected with default of an internal secretion.

6. *Physiology of the Mind*.—An exposition of the monist conception which seeks to explain the mental processes upon a purely physical basis. The author scoffs at prevailing psychology which he thinks is not yet sufficiently freed from metaphysical conceptions, regarding it as a "false science." Following out the idea of a physical evolution he seeks to trace the beginning of all mental processes back to the simple reflex which in the course of ages has been modified and multiplied into the countless activities of the life of to-day. The intellectual operations are preponderatingly involuntary and the individual mind is shaped by heredity and environment. Free will cannot in strictness be assumed to exist, though through the interplay of the reflexes, a choice between actions may in a sense be possible.

8. *A Medico-artistic Document upon Achondroplasia*.—Reproduction

of a photograph of a mural pannel in the Campo Santo in Pisa painted by Benozzi Gozzoli about 1469. This panel represents the "Tower of Babel," and the artist has introduced into it the figures of some of his celebrated contemporaries such as Cosmo de Medici, his son and grandsons. In the front of the picture is the image of a dwarf manifestly achondroplastic.

C. L. ALLEN (Los Angeles)

Deutsche Zeitschrift für Nervenheilkunde

(Band 37. Heft 5 and 6. August 8, 1909)

18. Contributions to the Types of Paralysis in Cortical Lesions. FOERSTER.
19. A Case of Stab-wound of the Spinal Cord. Contribution to the Conduction Pathways in the Cord. FABRITIUS.
20. The Diagnosis of Tumors of the Pineal Body. FRANKL-HOCHWART.
21. Bacteriological Examinations in Cerebrospinal Meningitis and their Medico-legal Importance. HASCHE-KLÜNDE.

18. *Paralysis in Cortical Lesions.*—The author reports a series of clinical and pathological cases with the view of substantiating the hypothesis that there are definite areas or centers for the various groups of muscles in the cerebral cortex. In the cortical motor regions, of the leg for instance, the pyramidal fibers for the various members (foot, leg and thigh) are separate from each other. Within these areas there are centers for the various muscle groups and these again in turn are divided into centers for the individual muscles. These lie sufficiently separated so that they may be affected individually.

19. *Stab-wound of the Spinal Cord.*—Patient, æt. 21, received a stab wound in the back 5.6 cm. to the left of the spinous process of the third thoracic vertebra. A complete flaccid paralysis of the right leg occurred. The left was intact. Sixteen to eighteen hours later occurred a noticeable paresis of the muscles of the left hip joint, and after twenty-four hours no movement could be produced. The knee, foot and toes were normal. This paralysis of the left side improved quickly and in ten to fourteen days had disappeared. Also marked improvement occurred in the right leg. A gradual improvement then occurred until patient was able finally to walk without a cane, though the right leg dragged slightly and the knee was held a little stiffly. There was distinct ataxia. The patellar reflex, after the accident, was lost on the right side but normal on the left. Several days later it was absent on both sides. Two months later it had returned. Sensation was completely lost on the left side but gradually returned.

The author concludes from a study of this clinical case, and others in the literature, that the motor pathways within the cross pyramidal tract do not run diffusely. Within this region the fibers to the hip for the most part are situated posteriorly or postero-internally, while those to the knee and foot are situated anteriorly or antero-internally. The tracts for the arms show an analogous arrangement.

20. *Tumor of Pineal Body.*—From an analysis of the cases in the literature and the symptoms presented in the author's case, a tumor of the pineal gland is present, when, besides general symptoms of brain tumor, there are symptoms in the young of marked increased growth, unusual mentality, premature genital and sexual development, unusual growth of hair, adiposity and morbid sleepiness. A differential diagnosis is some-

times difficult from tumor of the hypophysis when acromegaly is absent. The presence in the latter of bilateral hemianopsia and the X-rays should separate the two.

S. LEOPOLD (Philadelphia).

MISCELLANY

THE VESTIBULAR APPARATUS OF THE EAR AND ITS SYMPTOMATOLOGY. Goldman. (*Archives Générales de Méd.*, Aug., 1909.)

This is a review with a report of some personal cases in which symptoms referable to the nervous system arose from irritations of the membranous labyrinth. The main symptom considered is the provoked nystagmus of Barany, and its diagnostic importance is emphasized by cases. It is an especially valuable sign against nystagmus or troubles of equilibrium arising from lesions of the central nervous system where the cerebellar apparatus is implicated. Irrigation of the ear affords a rapid means of disposing of the pretensions of certain post-traumatic cases, and prevents a neurologist from believing in simulation when organic trouble is really present as shown by the symptoms of provoked nystagmus and troubles of equilibrium with vertiginous sensation, and sometimes even nausea, vomiting, sweating and palpitation. It would be well that the phenomena of provoked nystagmus and vertigo should be systematically studied by neurologists, in order to determine whether or not the other phenomena are dependent upon the nystagmus, as Barany believes, on account of one case where the ocular muscles were paralyzed and no vertigo appeared. It will be interesting too to discover what proportion of agarophobias and other psychasthenic manifestations are derived from labyrinthine perturbations. Research into this may modify the diagnostic criteria of "le vertige mental" of certain writers and play an important part in future nosology.

TOM A. WILLIAMS (Washington, D. C.).

Book Reviews

LEITFADEN DER EXPERIMENTELLEN PSYCHOPATHOLOGIE. A. Gregor. Berlin, S. Karger, 1910. Pp. x + 222.

In the form of a series of lectures this work gives a general account of the subject of psychopathology, using that term in its true sense as dealing with mental phenomena and not including natural pathology. The sixteen chapters are usually grouped in pairs in which are considered respectively the results on normal and abnormal individuals. The topics are as follows: reaction time and time sense; apprehension; memory; association; evidence; attention; movement, work and fatigue; and general intelligence.

The work should be in the hands of all who are interested in the study and the understanding of abnormal mental states. The excellencies of the book are manifold and they will appeal to all who read it. At the present time it is not possible to consider in detail all or even one of the topics, since the work in itself is a compilation and an abbreviation of numerous researches. We may, however, add a note of warning by way of criticism that the statements are often too dogmatic and *ex cathedra*, although this may be due to the form of presentation. If the statements be taken as an expression of the author's opinion no harm will result, for with them one may lay a foundation of solid knowledge without tracking as an expert through masses of detailed fine experimental results scattered throughout the psychological and psychiatric journals. The Germanic preferences, we might say exclusiveness, of the author is shown in the bibliographies which contain two hundred titles (many duplicates), only ten of which are to English and French authors.

The chapters on movement, fatigue and work show the excellencies and the faults of the work. Here we find accounts of work performed in the Heidelberg, the Munich and in other laboratories, including the results of experiments with the ergograph, with the writing balance, on the involuntary movements of the heart and respiration, etc. The conclusions are those generally accepted, some of which can be accepted only if more recent work be overlooked. For example, the 1896 work of Rivers is discussed but not his recent work of 1907, the results of which latter are disconcerting to and which throw much doubt on the validity of the conclusions of the Kraepelinian school.

It is worthy of note that this is the second book on psychopathology which has appeared from the psychiatric clinic at Leipzig under the shadow of the powerful influences of philosophy and anatomy. In them the anatomy of Flechsig has given place to psychology and the speculative psychology and philosophy of Wundt has resulted in an opposing reaction of practical application of the methods of experimental psychology. To the combination of both these apparently opposed influences we owe the present valuable work as well as its predecessor by Störring.

SHEPHERD IVORY FRANZ.

UEBER DIE KREUZUNG DER ZENTRALEN NERVENBAHNEN UND IHRE BEZIEHUNGEN ZUR PHYLOGENESE DES WIRBELTHIERKÖRPERS. Alexander Spitzer. Franz Deuticke, Leipzig and Wien.

Wundt, Flechsig, Ramon y Cajal and others have asked the question, why in higher vertebrates there should be a decussation of nervous tracts. At the present time no one has answered it satisfactorily, hence the author takes up the general question, why certain higher nerve centers are either entirely or in greater part connected with the periphery by crossed fibers in the depths of the central nervous system.

He first takes up the embryological evidence, showing by homologies that the neuroporic process in *Amphioxus* and the infundibular appendage in *Craniotes* argues that the brain axis ends in these forms in the infundibulum.

The embryological significance of the hypophysis is thoroughly dealt with and its relation to the gastro-intestinal system carefully followed. Considerable space is also devoted to the discussion of the general laws of phylogenesis and ontogenesis, heredity and environment, in their relations to the nervous system.

He then takes up the question of the development of the spinal cord, and shows how it has come gradually to occupy a position behind the intestines instead of in front, and how it has become twisted 180° in order to do this. This is the general line of the author's explanation. The work is extremely interesting, and for the anatomist and embryologist indispensable.

JELLIFFE.

LEHRBUCH DER NERVENKRANKHEITEN. Von G. Aschaffenburg, Köln; H. Curschmann, Mainz; R. Finkelnburg, Bonn; R. Gaupp, Tübingen; C. Hirsch, Göttingen; Fr. Jamin, Erlangen; J. Ibrahim, München; Fedor Krause, Berlin; M. Lewandowsky, Berlin; H. Liepmann, Berlin; L. R. Müller, Augsburg; Fr. Pineles, Wien; F. Quensel, Leipzig; M. Rothmann, Berlin; H. Schlesinger, Wien; S. Schönborn, Heidelberg; H. Starck, Karlsruhe; H. Steinert, Leipzig; Herausgegeben von Dr. Hans Curschmann, Dirigierendem Arzt der Innern Abteilung des St. Rochus Hospitals in Mainz. Mit 289 in den Text gedruckten Abbildungen. Berlin, Verlag von Julius Springer.

The combination text-book idea appears with marked accent in this most recent German text-book. Fortunately the contributors are all men of the very first rank, and their combined efforts, with the aid of a liberal and appreciative publisher, has given us a singularly attractive and valuable work on nervous diseases.

One feature of the work is worth calling special attention to. It is largely the work of younger men, and the different parts have been written by those who have paid special attention to the diseases in question. This helps to render the work more authoritative.

The work is for students and practitioners, and specialists can read the chapter by Rothmann on the physiology and pathology of the cord, and that by Liepmann on the physiology of the brain, with profit. They are exceptionally good and modern. Singularly enough, the cerebellum has been entirely omitted.

We have called attention to the two chapters which have attracted us the most; the others are as follows: The opening chapter on diagnosis is

by Schönborn of Heidelberg. This is excellent. Then follows Diseases of the Peripheral Nerves, by Steinert of Leipzig, giving a long, full discussion of over one hundred pages. The Diseases of the Spinal Cord are treated by Schönborn, by Jamin of Erlangen, Schlesinger, Finkelnburg of Bonn, and Müller of Augsburg.

The editor, Dr. Hans Curschmann, takes up the myopathies in another chapter; Hugo Starck treats the meningeal disorders, Lewandowsky, encephalitis, Hirsh of Göttingen, circulatory disorders, while Gaupp takes paresis and epilepsy.

A separate chapter on the Organic Diseases of Children, by Ibrahim, of Munich, calls for special attention. Chorea, tetany, tremors, etc., are treated under the head of Hyperkinetic Disorders by Pineles. Aschaffenberg adopts the term psychasthenic states, and includes under it hysteria, neurasthenia, traumatic neuroses, and obsessions and fixed ideas. It is a forceful, if somewhat loose, chapter. L. R. Müller has a short discussion on Diseases of the Sympathetic Nervous System, and Curschmann follows with another on the Vasomotor and Trophic Disturbances. Quensel considers the intoxications, and finally Krause gives an excellent chapter, all too short, on Operative Therapy of the Nervous System.

The technical features of this book call for special commendation. The printing and illustrations are superb, and the general make up, binding, etc., leaves nothing to be desired. It is a very creditable volume from every point of view.

JELLIFFE.

DIE KLINISCHE STELLUNG DER ANGSTPSYCHOSEN. Von Dr. Edm. Forster. Oberarzt an der psychiatrischen Klinik der Kgl. Charité und Privatdozent an der Universität Berlin. S. Karger, Berlin.

Forster is largely a follower of Wernicke and has here given an exceptionally brilliant study of this author's anxiety psychosis in a monograph of some 260 pages.

After first outlining Wernicke's original description as given in 1894 the author gives a short résumé of the general development and modifications which the concept has undergone.

He then enquires into the worth of the concept, should Wernicke's Angstpsychose occupy a separate clinical position deferring his answer until he has presented his general observations made during a three years' stay in the psychiatric clinic at Berlin.

An historical essay on the general subject of melancholia then follows. It is an interesting and valuable summary, although slightly scrappy and not well woven together; frequently words are taken as unchangeable symbols, and the historical perspective somewhat obscured.

The author's own observations follow, with very complete minute histories. These are divided into ten groups.

The author's general conclusions point to the fact that anxiety as such is an unsafe clinical criterium on which to found a special diagnosis. It occurs in too many forms of mental disorder to be thought of as pertaining to one alone. He allies his reported cases with pure melancholias, as already outlined by Wernicke himself, with the psychopathic constitutions, while there remains perhaps a group of cases that former authors have named agitated melancholias in part which perhaps may be said to be Wernicke's anxiety psychosis.

Reviewing the evidence in toto, however, the author is disposed to reject Wernicke's *Angstpsychose* as an entity, saying that most of the cases can be better grouped in with other psychoses.

The work as a whole is interesting—we do not consider it profound, and feel that the discussions are more directed against the symbols of psychiatry than the things themselves. It shows, however, the industry and promise of a brilliant young psychiatrist.

JELLIFFE.

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Original Articles

REPORT OF A CASE OF RESECTION OF DORSAL SPINAL NERVE ROOTS FOR GASTRIC CRISES OF TABES¹

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The gastric crises of tabes have been well known for many years, especially since the classical description of them by Charcot in 1868; though cases in which they probably occurred had been previously described, as by Romberg in 1851, and Grube in 1859, but our definite knowledge of this symptom as due to tabes has only been generally accepted since the work of Charcot. Crises are more apt to make their appearance in the earlier stages of the disease, and not infrequently are the first symptom. Fournier in 211 cases of tabes found this as the earliest symptom in 15, and Erb in 400 cases found it appearing first 10 times, while Starr in 450 cases, found it the first symptom 18 times, and occurring later 58 times. It often persists as the most prominent feature of the disease for many years, and sometimes occasions death; one of the rare causes of death directly due to the disease.

Because of the appearance of these paroxysmal attacks of

¹Read at the twenty-sixth annual meeting of the American Neurological Association held in Washington, May 2, 3 and 4, 1910.

vomiting before other symptoms, and even before the appearance of definite physical signs of the disease of the nervous system, gastric crises not infrequently lead to errors in diagnosis, and many cases are found in the literature as well as in the experience of all neurologists in which the patient has been subjected to useless abdominal operations and frequently more than one, as in the case reported by Eschbaum in 1908, to instance a recent example, where the patient had been operated upon four times, first a gastro-enterostomy for supposed pyloric stenosis in 1902, again in 1903, and in 1905, and finally an enteroanastomosis later in the same year.

The attacks of gastric crises seldom show great variations. The onset is usually sudden and without apparent cause. In the early stages the patients are free from symptoms on the part of the stomach during the intervals. The symptoms are of three sorts, pain, vomiting and general changes. The pain is generally very severe, and is chiefly in the epigastrium, though often radiating into the abdomen and the back. It is lancinating or boring in character, and is variously described as like the burning of a hot iron, or twisting sensation, and lasts from several hours to several days. The vomiting is usually large in amount and may or may not contain food at first according to whether food has been taken recently or not, but in case it has the vomiting is usually preceded by eructations and nausea. Hiccough may be a troublesome accompaniment. Later the vomiting may be only of mucus, or of bile-stained fluid, or may be fruitless and consist of retching only. Occasionally blood may be vomited in smaller or larger amounts, and rarely feces have been vomited. The general symptoms consist of pallor, sweating, indifference amounting to stupor at times, coldness of the extremities, the pulse small and either slow or quick, dizziness, cyanosis, aphonia. Diarrhea may also appear, in which case the pain is usually throughout the whole abdomen, and there is frequently intense tenesmus, a symptom complex that is called an enteric crisis. Rarely this condition passes into collapse which may terminate fatally.

The frequency of the attacks varies greatly and in many cases they become more frequent as time passes. In this case and when the attack is of considerable duration the general nutrition suffers and the patient not only loses weight but may become extremely

emaciated. This is also seen in the cases where with rare or even no gastric crises the appetite is affected, a condition not at all infrequent in tabetics.

During the attack of a gastric crisis the skin of the abdomen is frequently hypersensitive, and attacks of girdle pain, or of the lancinating pains often accompany it. During the attack the urine is generally scanty and high colored, and von Noorden has found acetone and diacetic acid at these times. Albumin and sugar do not seem to occur.

The attack usually terminates abruptly, and when fatal death is due either to cardiac failure or to the profuse diarrhea. The attacks are never isolated but always return. The duration of a single attack varies greatly, from a few hours or one or two days, up to eight to fifteen days or even longer.

In cases which have come to autopsy the stomach is usually found normal. Crouzon found it very small. Mathieu in one of his cases found nothing in the stomach, not even an erosion, though the patient had died of hematemesis. Eichhorst reports two autopsies recently in tabetics with gastric crises. In one he found the stomach contracted, and the mucous membrane pale and on microscopical examination there was no essential alteration, but a good development of gland tissue, and no changes in the gland cells, or other parts of the stomach wall. In his second case the wall of the stomach was thinned and in places the mucosa infiltrated with round cells, with some atrophy of glands which was diffuse and similar to the changes found in carcinoma of the stomach and pernicious anemia, that is probably secondary in nature. Kollarits also reports a case with autopsy in which blood was vomited repeatedly towards the last of the illness where post mortem no ulcer was found.

Considerable work has been done on the analysis of the stomach contents in gastric crises and some writers think that the local condition accounts for the phenomena. Sahli in 1885 found hyperacidity, and Rosenthal in 1886 the same, and ascribed it to bulbar irritation, as did Bourgaignon. Boas in 1889 and von Noorden showed that this was not always the case. Simonin, Hayem, Mathieu and Roux, and in this country Smithwick, working at the clinic for nervous diseases at the Boston City Hospital, have shown conclusively that either hyperacidity, or hypoacidity may be present during attacks and that the condition

may vary in different cases, and even in the same individual in different attacks. The general opinion of late years has been that the change in the gastric contents has no relation to the condition of the stomach or its secretions, but is to be explained as a pure nervous phenomenon.

Here again we meet with a diversity of views. Buzzard in 1880 advanced the theory that the nervous changes are situated in the medulla, and he found sclerosis about the vagus nucleus, but the cells apparently not affected, and ascribed the symptoms to irritation of the pneumogastric by this sclerosis, and argued for a similar seat of the lesion to account for arthropathies, as he had observed in his cases a rather frequent combination of these two symptoms, a combination which other observers have not found at all frequent. Oppenheim anatomically found atrophy of this nucleus in a case of tabes, as did Kahler, Landouzy and Dejerine, but the atrophy involved other nuclei also.

Leyden thinks the lesion causing gastric crises is not bulbar but of the peripheral nerve.

Roux ascribes the symptom to changes in the sympathetic nerves, and found on examining the sympathetic a disappearance of part of the finer myelinated fibers, and this view has also been taken by Foerster. He maintains that gastric crises are a sensory phenomenon of irritative origin and that the motor and secretory disturbances are secondary. He states also that in cases of tabes with gastric crises there is frequently hypersensitiveness of the skin of the abdomen and increase of the abdominal reflexes, and that the stomach is often hypersensitive to food even between the attacks. Both the vagus and the sympathetic nerves send fibers to the celiac plexus in the splanchnic major nerve, and then there is communication by the rami communicantes to the cord by the path of the seventh to ninth thoracic nerve roots. Foerster quotes Siding's case where there was a herpetic eruption over the areas of skin supplied by the sixth and the ninth thoracic roots, in support of his view. He admits however that some cases in which there are cardiac and laryngeal crises may be of vagus origin. Head places the path of stomach sensibility from sympathetic fibers by rami communicantes of the seventh to ninth thoracic dorsal roots. Mathieu in discussing the cause of gastric crises argues for an irritation of the solar plexus, apparently on theoretical grounds.

The medical treatment of gastric crises, as in most other obstinate affections has embraced a large variety of drugs, most of which are without effect though now one and now another seems to help in an individual case, chloral hydrate, cocaine, chloroform, cannabis indica, oxalate of cerium, intra-spinal and epidural injections of cocaine, nitrite of soda subcutaneously, strychnia, morphine, all have their advantages and disadvantages, the latter generally much outweighing the former.

Aside from various operations in cases of gastric crises which have been undertaken with mistaken diagnoses, or in the hope of finding some anatomical condition which might be remedied, surgeons have generally avoided operation for this condition, or have not reported the results. Dubar and Leroy in 1907 report two cases in which gastro-enterostomy was done in the attempt to relieve attacks of this nature. The first, which was done in 1903, was still free from attacks in 1906. The second case was reported as relieved, though it was not stated for how long a time nor to what extent. The authors argue for a pyloric spasm as the cause of the attacks. In 1906 Vallas and Cotte reported an operation for the relief of this condition, but we have been unable to find any report of other operators who have followed their example. Their patient, a man of 41 years, had suffered for six or seven years from gastric crises, with severe pain and uncontrollable vomiting, at first accompanied by some hematemesis; the attacks at first coming every three or four months, but for a year recurring every month and lasting about three days. He had suffered from lancinating pains for two years, and showed the Argyll-Robertson pupil, absent patellar reflex, and beginning ataxia. On January 28, 1906, he was operated upon and the solar plexus stretched, with complete relief of pain lasting up to the time of the report to the Society of Medicine of Lyons on March 26, 1906. The authors state that this is the first instance of this operation being done in tabes.

It remained for Foerster to try for this condition the application of the operation of resection of dorsal spinal nerve roots, an operation which had been used previously by various medical men for the relief of severe and uncontrollable pain, and which was reviewed by Dr. Knapp before this Association a few years ago, and by Dr. Jacoby in 1908, and which at the present time is being applied to the relief of spastic paralyses also.

The first case where this operation has been done for the gastric crises of tabes was reported last year by Foerster and Küttner. The patient, a man of 47 years, had suffered from crises for seven years so severely that of late he had been able to eat only five or six days in each month, and had become much emaciated, and a morphinist. He showed myosis, and the pupils reflexly rigid, lancinating pains in the arms, legs and ribs, occasionally delayed micturition or incontinence. There was hyperesthesia of the whole abdomen and lower part of the thorax, increased epigastric reflex, which could also be elicited by irritation of the skin of the lower part of the thorax, and the inner side and front of the thighs. Because of the presence of colic-like pains in the abdomen, at the operation four nerve roots were cut, the seventh to the tenth thoracic ones. The pain and vomiting disappeared after the operation, the appetite became good, and the man gained 2 kilogrammes a week. There was some abdominal colic left. After the operation there was an anesthetic zone three fingers breadth below the ensiform cartilage, to one finger breadth above the umbilicus, while below the navel there was hyperesthesia. The epigastric reflex could not be elicited from the anesthetic zone, but was obtained from above and below this, but no longer from the thighs. After the operation the disturbance of control of the bladder, the paresthesia in the hands and feet, and the lancinating pains continued. There were no unpleasant effects from the operation.

The second report of a case in which this operation had been done for this condition is by Bruns and Sauerbach, the operation being done on June 18, 1909, by Friedrich. The patient, a man of 40, had been treated frequently for gastric crises since December, 1907, the first attacks dating back however nine years, but he had worked until 1907. The attacks had grown longer and more frequent. Treatment by narcotics, stomach washing, faradization, atropin, local compresses were without effect, either upon the severity or the number of the attacks, though there was some relief from protracted warm baths given almost daily. He had lost 58 lbs. in two years. The abdominal reflexes were lively and increased, and could be elicited from the outer side of the thighs. There was no hyperesthesia in this case, however, but a diminution of perception for touch and pain, and a loss of cold perception from three fingers above the nipples to the crest

of the ilium. Heat in this area was painful. The crises began with sharp pain in the epigastrium, and into the shoulder region. He threw himself about and cried. Then came repeated vomiting so that often collapse threatened. The attacks were often accompanied by diarrhea, and three times he had vomited firm feces. For the last year he had vomited almost daily, and every day had had some pain. At the operation the seventh to the ninth thoracic dorsal roots were cut close to the cord. The patient said that he had lost sensation in his belly two days after the operation. He did not feel the stomach full but felt hunger and thirst normally. He had anesthesia for touch and pain from the lower third of the breast bone to the navel. Temperature sense was generally appreciated correctly above and below a space of one or two fingers breadth where touch was impaired only. In the back from the middle of the shoulder blade to the second lumbar spine there was anesthesia for touch and pain but hyperalgesia for temperature. The abdominal reflex was absent when the anesthetic zone was irritated, but could be obtained and was increased from below this area and from the thigh. In seventeen days the patient gained fourteen pounds and on August 2 had gained 45 lbs. Up to the time of the report of the case on September 29, 1909, the patient had had one slight attack of pain after drinking sour milk but no other trouble.

Our case is that of a man who had been under our observation for some time.

J. D., a widower, when he was first seen entered the Boston City Hospital on August 3, 1908, and was then 30 years of age. He was a telephone operator. He had had gonorrhea at 16 years, but never had a chancre. He was married at 19 years, and had one child 11 years old who is healthy. After the birth of this child his wife had three or four miscarriages, and after this deserted him. The cause of the miscarriages was unknown to him. He had had no acute disease since the acute infectious diseases of childhood, and the last of these was when he was about eight or nine years old. About eight years previously he began having sudden attacks of severe pain in the stomach and abdomen accompanied by vomiting and diarrhea. The duration varied from one to ten days. At first the attacks were not very frequent, but grew more so, so that lately he had seldom gone a week without an attack. He had had no lancinating pains, no disturbance of the control of the bladder, no diplopia or failure of the eyesight, but thought there had been some lessening of the sexual desire. At that time, on examination, the pupils were of

moderate size, equal, regular, reacting to accommodation but not to light. There was no diplopia, strabismus or nystagmus. There was slight diminution of the sensation for pain on the chest from the third to the sixth rib, but none elsewhere, and the sensation for touch was not affected. The gait was normal. There was slight swaying on standing with the eyes closed and feet together. There was a very slight ataxia in the legs when the eyes were closed, and well marked hypotonicity of the legs. The knee jerks were present and fairly good, and the ankle jerks were present at that time. Biernacki's sign was present on the left, but not on the right. The analysis of the gastric contents after a test meal showed no free hydrochloric acid, and a total acidity of 0.08 per cent., the amount 80 c.c. No food, no lactic acid, no mucin and no blood present. He gave a history of having vomited blood at times. He had gone down in weight from 135 lbs. to 100 lbs. On September 22, 1905, at another hospital an abdominal operation had been done in the hope of finding a condition that could be relieved. The stomach and all organs had been found normal except for a few adhesions of the great omentum to the gall-bladder from the fundus to the duct. The pylorus was normal, as well as the pancreas, intestines and appendix, and there were no gall-stones and no enlarged glands. The adhesions about the gall bladder were freed, but it was noted that these did not pull on the stomach. The fundus of the gall bladder was sutured to the liver and the wound closed. There was no improvement after this operation.

He was treated at the hospital in the out patient department, and in the wards at intervals—August 24, September 4, December 29, 1908. This last time there was blood in the vomitus and it was noted that the stools were loose, watery and from five to ten a day, and accompanied by tenesmus. He was again in the hospital January 9 to April 13, 1909, with frequent attacks during his stay. The white cell count of his blood at this time was 19,000. He was next in the hospital from June 21 to July 8, and again August 13 to September 13, 1909. During this time Naguchi's serum reaction for syphilis was made and gave a positive result. At times while under observation he would lose consciousness for a few moments, and breathing would cease when the pain was severe. The man had acquired the morphine habit before he was first seen at the City Hospital, and at that time he stated that he was using a grain of morphine a day.

Just before the operation, examination showed an area of diminished sensation for pain on the chest from the third to the fifth ribs, and below that normal or slightly increased sensibility for pain to the level of the umbilicus on the right, while on the left there was hypalgesia from the third to the seventh ribs and hyperalgesia below that to the level of the umbilicus. The abdominal and epigastric reflexes were present. The pupils did

not react to light, but did with accommodation. Hypotonicity in the legs was well marked.

The operation was done March 3, 1910, and was completed at one sitting. With the patient lying on his face, with his back strongly arched forward, an incision was made in the median line from the spine of the fourth dorsal vertebra to the spine of the eighth, extending down to the tips of the spinous processes and then was carried on either side down to the arches of the vertebræ. The hemorrhage was not profuse and was controlled by firmly packing with gauze. The spinous processes were cut off at their bases by bone forceps, and then with small rongeur forceps the lower border of the arch of the fourth dorsal vertebra was cut upwards in the median line to allow the introduction of bone forceps. The fourth arch was then divided from below upwards with bone forceps, and the arches of the fifth, sixth and seventh vertebræ were divided on either side of the median line from above downwards. This step, although a minor point, is of value because it allows much more ready division of arches. The removal of the arches gave an excellent exposure of the dura. The dura was then divided by very small pointed scissors in the median line and with an escape of about half an ounce of cerebrospinal fluid. Two snap forceps grasped the edge of the dura on each side of the incision and acted as retractors. The pia was extremely thick, almost a quarter of an inch, and very edematous, giving a curious gelatinous appearance. When the pia was reflected, it gave an excellent view of the cord. There was no hemorrhage from the vessels of the dura or of the pia. The posterior nerve roots were easily recognized and seemed unusually small. At this portion of the spinal cord the interval between the dorsal and ventral roots is very considerable. The dorsal roots were raised by hooking them up with an aneurism needle and were divided close to the cord, and the ends were then drawn down parallel with the cord. The seventh, eighth, ninth and tenth roots on each side were divided. The edges of the dura were carefully sewed together with very fine silk. The incision through the skin and the erector spinæ muscles was closed by through and through interrupted sutures of silkworm gut placed fairly close together. The skin incision was very carefully approximated, and a dry sterile dressing was applied. Healing took place by primary union. The entire operation took fifty minutes.

The patient was put to bed without fixation of any sort, either plaster or a Bradford frame. There was no vomiting on coming out of ether and the epigastric pain which had been severe directly before the operation was entirely absent. There were however severe spasmodic girdle pains in the lower thoracic region, just above the epigastrium, coming on at short intervals and accompanied by marked spasm of the chest wall. On the morn-

ing after the operation there appeared to be no loss of tactile sense over the epigastrium or abdomen. The frequency and severity of the girdle pains in the thoracic region gradually diminished and had entirely ceased at the end of about ten days. At no time was there any severe pain in the dorsal region. Three weeks after the operation the patient suddenly turned cyanotic and ceased to breathe and the collapse was so extreme that it was reported to the house surgeon that the patient was dead. Artificial respiration brought him around in a few minutes, and when seen about ten minutes after this attack the patient showed no evidence of the severity of the seizure. Examination of former hospital records showed that the patient had previously had similar seizures. A few days later there was a similar attack, recovery from which was almost immediate.

It is extremely difficult to tell how much of the pain which lasted for the first two weeks was real, and how much of it was due to the desire of the patient to have his morphine continued.

The operation presented few technical difficulties. As has been mentioned the hemorrhage was slight and was readily controlled by packing. It is possible that the tension exerted on the dura by application of snap forceps may have brought undue tension upon the nerve roots above and below the opening in the dura. Another time we should steady the cut edges by sutures, rather than by snap forceps. Possibly this might diminish the irritation of the nerve roots above the point of section. There was some difficulty in locating the desired nerve roots, due to the fact that after the arches were divided the anatomical landmarks were lost. It would be desirable to mark the first arch divided, possibly by driving a small wire nail into it directly after it is divided to be used as a guide during the operation, but to be removed when the operation is completed.

The relief from pain was remarkable and immediate, in spite of the fact that for a time there was no apparent loss of sensation, at the end of about ten days the loss of skin sensation was marked over irregular areas and at present the loss of sensation is complete.

The details of the examinations show that on March 8 the perception of touch was diminished on the right side from the third rib to half way between the border of the ribs and the umbilicus, and on the left from the fifth rib to the same level. There was hypalgesia in that same area but not analgesia. The abdominal and epigastric reflexes were absent. The patellar reflexes were present, as well as the right Achilles reflex, but this reflex was lost on the left. It was on March 20 that the man lost consciousness and stopped breathing, as has been mentioned above. He complained of quite severe girdle pains which were in the lower chest, well above the epigastrium. There was no paresis of the legs or disturbance of the control of the bladder at any time after the operation.

March 28 he had the second fainting attack, which was less severe than the first, and the girdle pains were still quite severe, but the muscular twitching had ceased. That night he vomited but had no pain in the epigastrium. This we thought due to the fact that he had been taking quite large doses of mercury by mouth, or possibly to the attempt to diminish the morphia. During this time he had occasional sharp pain in the legs.

He was next examined on April 11, after his discharge from the hospital. He had had no pain in the epigastrium or abdomen and had had no more vomiting. The pain in the chest had practically ceased, though he occasionally felt it slightly. His appetite was poor and he had not gained in weight but he had been unable to stop the morphine. On April 19 he vomited once more after eating heartily of beans but again with no pain. This vomiting was of food only and then ceased at once.

On April 22 examination shows absolute loss of the sense of touch and pain from the sixth rib to three fingers breadth above the umbilicus. The abdominal reflex could not be elicited from this area but was obtained and was lively when the skin of the lower part of the abdomen was irritated.

The final result in this case it is too soon for us to know. On theoretical grounds it may be that the operation is useless from the fact that the nervous influence of the disease upon the stomach may take place only through the vagus but the result in the two previous cases would seem to make this improbable. Then it may well be that the path of the nervous influence producing gastric crises may not be the same in all cases and in that event we may find the resection of the appropriate dorsal nerve roots of value in some cases and not in others. In this particular case the complete absence of epigastric pain since the operation is most encouraging and gives us grounds for thinking that the occasional vomiting which has occurred since the operation may be due to accidental causes or possibly from the attempt to diminish the dose of morphine and go without the drug which the man has been making, as at one time he went for thirty hours with no morphine, and what vomiting he has had, has been only at times when he has been without the drug. A final judgment can only be formed after he has been cured of his morphinism.

At present the operation seems to us to be one of very distinct promise in the treatment of this extremely troublesome and severe symptom of tabes and one well deserving the attention of neurologists, surgeons and internists, but on account of the severity of the operation not one to be lightly advised in all cases of gastric crises, but for the present at least, one which should be reserved for the severer cases where relief by other methods of treatment has not been obtained. Yet it should certainly be

considered seriously in all cases where the severity of the attacks has been such that the patients are forced to the use of morphine for relief, even when the attacks do not occur with great frequency, in order to prevent the formation of the drug habit, a thing which is practically almost certain to happen where morphine is found to give relief from the symptoms which other drugs and other methods of treatment have failed to give.

It is with the object of calling the attention of physicians to the new application of this operation of resection of dorsal nerve roots to another disease in which severe pain has not been relieved by other methods that we have reported this case in such a short time after the operation, knowing that a final judgment upon its merits cannot be formed till we have reports of a number of carefully observed cases of the kind. We have heard of this operation having already been done for the relief of gastric crises in New York City though the report of the case has not yet been published at the time of the writing of this paper, and the case was not known to us at the time of the operation, and since our case was operated upon two similar operations have been done in Boston, at the Carney Hospital by Dr. Bullard and Dr. Munro, and at the Boston City Hospital by Dr. Knapp and Dr. Blake.

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AUTOPSYCHOLOGY OF THE MANIC-DEPRESSIVE

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Although insight is generally given as one of the diagnostic features of manic-depressive insanity, and is enumerated by Kraepelin as one of the characteristics of this psychosis, a careful study of the question would indicate that it is not as constant as is generally supposed. The following figures are based on a series of one hundred cases of manic-depressive insanity treated in the Government Hospital for the Insane during the past two years. These cases have been discharged recovered, or have recovered and remain in the hospital, owing to their short periods of lucidity:

	Per Cent.
Insight complete	39
Insight partial	33
Insight lacking	28

The majority of these are cases in which there can be no doubt as to the diagnosis, inasmuch as they have had one, and in some cases many previous attacks. In compiling the above figures it was noted that all those cases manifesting complete insight into their condition were persons of average or superior intelligence, and that there were no colored patients in this group. Of the twenty-eight cases completely lacking in insight, six were colored and twenty-two were white. Only five of the twenty-eight were persons of education. We are, therefore, led to believe that insight is, to a large extent, dependent upon the intelligence of the individual. The records of this hospital fail to show that insight is ever complete in the colored race.

According to Clouston (1), true manic depressive insanity is essentially a psychosis of the educated. He states: "I never met a typical case of manic-depressive insanity in a person whose own brain and those of his ancestors had not been educated. It seems to me that the tendency to alternation of mental conditions—to energize at one time with morbid hurry, and then with morbid slackness—results from too much pureness of blood, or

from the heredity of many generations of gentlefolks, all of whose brains had been more or less educated. Possibly it is one of the modes by which nature brings that kind of stock that has become degenerate by over-cultivation of the brain for many generations to an end." On the contrary, the records of this hospital show that manic-depressive insanity occurs very frequently in the colored race, and that their attacks are typical in all respects, unless a lack of insight would be considered atypical.

A lack of insight in some cases may be accounted for by the theory of Arnaud that lucid periods of short duration do not represent a return to the normal, but are of a nature of an amelioration of the symptoms rather than a cessation of same; that many persons with manic-depressive insanity are never absolutely normal, and are therefore not in a position to take a proper view of the situation. I have at the present time, under my care, a woman of intelligence and education, who for twenty years has been treated in the Government Hospital for recurrent attacks of mania. At no time will she admit that there has been anything the matter with her mind, although her excitements are of the most violent type. She invariably ascribes her peculiarities of action to the curtailment of her liberties, and asserts that anyone treated in like manner would have shown a similar reaction. Her periods of lucidity are short, rarely lasting a year, and it is a question whether or not she could ever be considered normal. That she possesses some insight, although she refuses to admit it, is shown by the fact that during her so-called lucid periods she is perfectly satisfied to remain in a hospital for the insane.

The following cases are of interest on account of the complete insight manifested by the patients, and the coherent and detailed account they are able to give of their mental processes during their periods of excitement and depression. It is a fact frequently overlooked by physicians and attendants that during their periods of deepest depression, or most violent excitement, these persons are keenly alive to their surroundings and the treatment they receive, and that it is necessary, in order to retain their confidence and respect, to treat them humanely throughout their psychosis. They bitterly resent any injustice or cruelty inflicted upon them during this period. This is very clearly brought out in Beer's "The Mind that Found Itself." Although

the author was probably somewhat lacking in insight when the book was written, the presumption is that he had cause for resentment. It is also evident that he was in a state of hypomania at the time. I have found that this is the stage in which these patients can give the best account of their experiences. When they return to their normal mental condition they have a feeling of shame in regard to many of their speeches and actions, and they refuse to think or speak of them. They endeavor to forget the whole matter, and wish others to do the same. While they are just recovering from an attack of excitement, and are in a slightly exalted state, their experiences are fresh in their minds, and they have the loquacity and productivity necessary to express their feelings. If the psychological moment is allowed to pass it is impossible, in most cases, to get any account of their mental processes during their psychosis. It is also necessary to secure the full confidence of the patients, and to make them understand that these investigations are carried on for scientific purposes and not for the sake of mere curiosity. The following account was written by Patient no. 1 while she was in a state of hypomania. When she returned to her normal mental condition she was allowed to read what she had written. While she confirmed the truth of all her statements, she affirmed that she had forgotten many of her strange experiences at that time, and the recalling of them to her was painful in the extreme.

The following cases are also of interest in regard to the matter of pain as a symptom in manic-depressive insanity. This is a subject that has received but little attention in the past, although the hospital records would indicate that it is almost a constant symptom in the female patient. In several cases under my care the first symptom of an oncoming excitement is pain. Imboden (2), in writing on combined psychoses, ascribes the pain of manic-depressive to the fact that this psychosis is often associated with hysteria. Nissl (3) also states: "It is a scientifically proven fact that in manic-depressive insanity separate hysterical symptoms, as well as a simple symptom complex, are often mixed with the general clinical picture. When these have not appeared in former life, and do not appear in the lucid intervals, there is no doubt but there is a well-characterized combination of the two mental disturbances." Tanzi (4) classifies pain in manic-depressive as a "retrospective illusion," and states that

the conduct of the patients belie their statements that they are suffering pain.

On the other hand, Shroeder (5) has made extensive observations on this subject. He found that in a series of 130 cases of manic-depressive insanity, treated in the women's division at Rothenberg, 62 per cent. suffered from severe pain during some part of their psychosis. He carefully excluded all cases in which there was a suspicion of hysteria, and those in which pain in the back predominated, owing to the ambiguity of this form of pain in the female. These pains appeared in various parts of the body, in the following order of frequency: (1) the extremities, (2) the head, (3) the abdomen, (4) the heart region. In none of these cases could be demonstrated any hyperalgesia or hyperesthesia, and the areas of pain did not correspond to the anatomical distribution of one or more sensory nerves. In the majority of cases the areas of pain remained constant for weeks and months, although they varied in intensity of the pain. He describes various cases in which diagnoses of cholecystitis, renal calculus, duodenal ulcer, and cystitis were made. All manner of therapeutic agents were used in these cases without success. He states that a visible and continued benefit was gained by explaining the origin of the pain to the patients, and they almost invariably learned to rise above their affliction, in which they differed widely from the hysterical sufferers. Bruns (6) has published a report of five cases of melancholia with concomitant neuralgic symptoms, although he proved to his own satisfaction that a true neuralgia did not exist.

The influence of the psychic processes, especially the emotions, upon the metabolism and functional capacity of the various organs is a phenomenon patent to all. Mental depression causes a disturbance of the function of digestion. Grief, shame, anger, fear, etc., call forth an instantaneous response from the lachrymal and sudoriferous glands, the kidneys, the vaso-motor system and the motor nerves to both voluntary and involuntary muscle. It is rational to suppose that in a profound mental disturbance such as manic-depressive insanity, where the emotions play such a large part, there is a corresponding disturbance of the metabolism of the body, and of the function of the various organs. Why the psychic disturbance of manic-depressive should manifest itself in the form of pain is a question yet to be solved, but that actual

pain does exist is to my mind an unquestionable fact. The clear and definite account of the pain endured by Case no. 1 was confirmed by her facial expression of distress and anxiety. Although this account was written by her while in a state of hypomania, as hitherto stated, when she returned to her normal mental condition the impression of pain was very vivid in her memory. That an actual pathological condition of the peripheral nerves exists is contraindicated by the fact that these areas of pain do not correspond to the anatomical distribution of individual sensory nerves, and the absence of hyperalgesias and hyperesthesias. The fact that Case no. 2 suffered from a severe attack of herpes zoster, following the course of the fourth and fifth intercostal nerves, the area in which she had complained of pain for some time previous, would indicate that in this case at least there was a disturbance of the function of the central neurones. Dolan (7) states: "Although no organic pathology is yet demonstrable in manic-depressive insanity, surely some pathological condition must exist, causing intermittent damage, if not permanent injury to the neurones. Is it not possible that apart from amentia in any degree there is in the affected individual a pathological condition, not necessarily of the neurones, though of a kind to affect their normal function."

It is interesting to note that Case no. 1, a trained nurse, had, during her excitement, worked out an explanation for the peculiar sensations in her head similar to that suggested by Tanzi—namely that there is a hyperemia of the brain during excitement, and an anemia during depression. He states, however, that careful investigation by Loveland has shown that there is often a polycythemia in melancholia and an anemia in mania. Meynert has attempted to show that the psychosis is connected with the innervation of the cerebral vessels; that during mania there is a paralytic condition of the vaso-constrictors, causing a hyperemia, and during melancholia they are in a spastic condition, causing an anemia.

The subject of treatment in manic-depressive insanity, from a patient's standpoint, is interesting to those who have the care of such patients. As previously stated, these patients on their return to normal have a feeling of shame in regard to the matter of their psychosis, and wish to forget it as soon as possible. Many of them keep as a secret from their friends and acquaint-

tances that they have ever been insane. I am of the opinion that this is the reason we do not have more newspaper and magazine articles of the character of "The Mind that Found Itself." If the manic-depressives of this and many other countries would write an account of their treatment in many of the hospitals for the insane, I am inclined to believe it would make literature sufficiently sensational to occupy the front page of some of our "yellow journals." With the advancement of medical science along other therapeutic lines, it seems almost incredible that the therapeutics of the middle ages should still be applied to these unfortunate individuals, even in civilized countries. Lugaro (8) states that in many of the Spanish asylums maniacal patients are chained down at the present time. The ancient treatment of the insane by instruments of torture, chains, stocks, straight jackets, padded cells, etc., might be excused on the ground of the dense ignorance of the medical profession at that time in regard to the nature of insanity, but in this enlightened age it is certainly deplorable that recommendations by committees of investigation, and even acts of legislature are necessary to make the medical profession do its duty by these afflicted patients. The reading of the story of Case no. 1 will convince anyone that to have added to her suffering by restraint would have been cruelty of the most brutal kind. *Personally I have never seen restraint used in these cases, nor does it appear to be necessary or desirable. Seclusion, on the other hand, is asked for in many instances by the patients who possess full insight.* Forced feeding is important in all cases of exhaustion and adynamia. It is possible, in the majority of these cases, to produce an increase in weight by this means during attacks of the most profound depression or violent excitement. Case no. 1 was for six months in a condition of the most extreme motor excitement on record at this hospital, yet during that period she gained fifteen pounds in weight. In many instances there is a disinclination to take nourishment owing to the disturbance of the gustatory sensation. The manic-depressive, unlike the præcox case, is teachable, and usually one meal administered by means of the feeding tube is sufficient to stimulate the appetite to the point of taking nourishment voluntarily. In most cases hydrotherapy is the treatment "par excellence." I have observed that after the first attack the patient is often able to indicate the most

effective treatment for her particular case. In one of our wards at the present time is a woman who for many years has been treated for recurrent attacks of mania. For certain reasons it is necessary to keep her on a chronic ward at some distance from the hydrotherapy room. When her excitement becomes so intense that it is impossible to bring her to the hydrotherapy room for treatment, she asks permission to sit under the shower bath for two hours daily. Notwithstanding the fact that her excitement and confusion become so great as to render her almost incapable of performing a rational act or uttering a coherent sentence, she makes her way to the bathroom and takes her treatment with the greatest regularity. A retired army major who has recently recovered from an attack of mania, told me that he had tried all possible combinations of the water treatment, and had worked out for himself quite an elaborate programme, which he found of great benefit in lessening his excitement. This consisted in taking the hot box for fifteen minutes, cold pack for one hour, hot needle bath, followed by cold shower and Scotch douche. He also found that sleep could be induced during his periods of the greatest excitement by the use of a continuous bath at 99° for one hour. I have not mentioned the use of drugs—hypnotics and sedatives—as I consider they have no place in the treatment of manic-depressive insanity.

In conclusion, I would say that there is no fixed rule for the treatment of manic-depressive cases. Every individual is different and it is only by a careful study of each one that a line of treatment can be prescribed. While hydrotherapy is indicated in the majority of cases during the maniacal stage, some individuals have a distinct hydrophobia during this period. Case no. 1 enjoyed the water treatment, Case no. 2 refused absolutely to take it. Both of these patients asked to be placed in seclusion, while some individuals have a horror of this treatment. As I have previously stated, these patients take an intelligent interest in their surroundings and treatment throughout their psychosis, and after their first attack, if not during it, they can give advice which, to my mind, is invaluable in their care and treatment.

CASE NO. 1. Early in January, 1908, I was seized with an unspeakable physical weariness. There was a tired feeling in the muscles unlike anything I had ever experienced. A peculiar

sensation appeared to travel up my spine to my brain. I had an indescribable nervous feeling. My nerves seemed like live wires charged with electricity. My nights were sleepless. I lay with dry, staring eyes gazing into space. I had a fear that some terrible calamity was about to happen. I grew afraid to be left alone. The most trivial duty became a formidable task. Finally mental and physical exercises became impossible; the tired muscles refused to respond, my "thinking apparatus" refused to work, ambition was gone. My general feeling might be summed up in the familiar saying "What's the use." I had tried so hard to make something of myself, but the struggle seemed useless. Life seemed utterly futile.

One day it seemed to my disordered mind that one of the vertebrae in the dorsal region was pressed into position. The blood seemed to be carried to my brain in such quantities that the skull was too small to contain the brain enclosed therein. The feeling of emptiness gave way to a sensation of fullness and pressure. It seemed as though the condition of cerebral anemia had given place to one of congestion. By beating my head against the floor and walls I believed that I loosened up the sutures and gave the brain a chance to expand. It certainly gave me relief. On two occasions a slight epistaxis seemed to relieve the pressure and clear my thinking processes. This confirmed my theory of cerebral congestion. I had a feeling that the cranial nerves on the left side were adhering to the skull as ivy clings to a stone wall. Beating my head against the wall appeared to tear them loose from their support and relieve the tension. The muscles which heretofore had refused to respond to stimuli now refused to remain at rest. To keep physically quiet was an utter impossibility. The strain of trying to keep still was fast wearing me out. I would lie in bed and jump up and down on the springs; I would make numerous excuses to go for a drink and to the toilet, simply to be doing something. My thought processes which hitherto had been retarded, and their expression difficult, now began to flow with lightning rapidity. Thoughts crowded into my mind too rapidly for expression. Talking was the greatest relief imaginable. Formerly I was afraid to be left alone, now the one thing for which I longed was solitude. This was denied me. I was at this time a patient in a general hospital, of which I was formerly assistant superintendent of nurses, and it was considered necessary to "special" me night and day. Constant observation was maddening. There was an ever-present fear that in my constant talking, which I was unable to control, I would reveal professional secrets that had been entrusted to my care. In my official capacity as assistant superintendent I had been the receptacle of many confidences by the doctors, superintendent, nurses and patients. These confidences—many of them too sacred to be

bared for common curiosity—weighed on me constantly, and I dreaded lest in my delirium I would reveal them. Over-anxiety to retain mastery of my mind caused an extreme tension of the nerves all over my body. The presence of a nurse, always at my bedside, drove me frantic. Restraint was irritating and almost fatal. The fact that I was being watched and observed rendered sleep impossible. Drugs had no effect. I begged to be sent to the Government Hospital for the Insane. My one desire was to get away from over-anxious and over-curious friends and acquaintances. On March 1, 1909, I was removed at my own request to the Government Hospital, to recover, to go permanently insane, or to die. I confidently expected the last would be my fate.

Words fail to describe the feeling of relief I experienced when I was at last placed in a strong room at my own request. To be alone, to be shut off from the observation of the anxious and the curious, to be free to act and talk in any way my distorted fancy dictated was relief unspeakable. Here I was among strangers who cared nothing for the secrets I disclosed. They did not even stop to listen to them. They did not appear to be surprised or shocked at my wildest words or actions. I was not told a hundred times a day that I *must* keep quiet. I talked, laughed, cried, sang, shouted and danced to my heart's content. The giving up of all attempt at self-control brought the needed rest and sleep.

The condition of my mind for many months is beyond all description. My thoughts ran with lightning-like rapidity from one subject to another. I had an exaggerated feeling of self importance. All the problems of the universe came crowding into my mind, demanding instant discussion and solution—mental telepathy, hypnotism, wireless telegraphy, Christian science, women's rights, and all the problems of medical science, religion and politics. I even devised means of discovering the weight of a human soul, and had an apparatus constructed in my room for the purpose of weighing my own soul the minute it departed from my body. At one time I was elected to Congress by my own district. I was teacher, preacher, reformer, lawyer, judge, physician, actress, artist, poet and writer, all within a wonderfully short space of time. Probably my most prominent delusion was that I was at the Government Hospital for the purpose of thorough investigation, supervision and reformation. Each article of clothing and bedding given me was tested by pulling on it with all my might. If it tore, I immediately condemned it as being unfit for use, and tore it into shreds. I decided it was manufactured by convict labor, and utterly unfit to be used by an august person like myself. The crockery I tested by throwing it against the walls and ceiling. If it broke it proved to me conclusively that it was unfit for use in a govern-

ment institution. I felt it my duty to train and instruct the nurses. My efforts in this direction seemed entirely unappreciated. The valuable instruction so freely tendered was set at naught, spurned and trampled underfoot. In fact, I do not think they even stopped to digest it. Although my egotism was unbounded, yet I never for one moment was happy. Always being accustomed to bear responsibility, the exalted rôle I played served only to increase the burden of care. The propagation of all reforms for the betterment of the human race devolved upon me. I arranged programs and entertainments for Decoration Day, Fourth of July, Labor Day, Thanksgiving and Christmas. I staged "Tillie the Mennonite Maid," managed a circus, conducted revival meetings for the benefit of the colored men who worked on the lawn. I made countless speeches, watching the facial expression of the other patients to see the effects of my oratory. This was usually far from encouraging. I designed cartoons, composed newspaper articles, diagnosed cases, prescribed treatment, planned kindergarten games. I sang by the hour, with an idea of chest expansion and voice culture. I tried cases in court, weighed the evidence pro and con, and rendered my valuable (?) decisions. I "bossed" the carpenters who repaired the porch where I sat. I gave advice to the painters. I never failed to obey the biblical injunction to "entertain strangers." For the benefit of the visitors who came in the ward, I performed athletic "stunts," improvising apparatus. This often necessitated the removal of the bolts from the beds. The bowls in which the soup was served made excellent missels with which to practice for a baseball pitcher. The pieces were even more useful. They made more noise, and could be used to make deep indentures in the walls of my room. The doors were of pine, and by scratching them deeply with pieces of broken dishes I could smell the odor of the pine tree, which was very agreeable. My inability to throw straight was all that saved the electric light in my room. The hair from the inside of my pillow and mattress was just what I needed to make a wig in which to impersonate an old lady in my plays. The ticking from the pillow was converted into a sunbonnet to represent the girl whose picture is on the back of the music of "School Days." The blankets torn into strips made excellent bandages, and were just what I need for teaching purposes. I tore the sheets into strips and arranged designs for kindergarten games on the floor. In all this I had a feeling of resourcefulness, and many times called to mind the saying of the superintendent of our hospital: "If there's one think I admire it's a woman of resources." Thoughts chased one another through my mind with lightning rapidity. I felt like a person driving a wild horse with a weak rein, who dares not use force, but lets him run his course, following the line of least resistance. Mad impulses would rush

through my brain, carrying me first in one direction then in another. To destroy myself or to escape often occurred to me, but my mind could not hold on to one subject long enough to formulate any definite plan. My reasoning was weak and fallacious, and I knew it.

My sleep was so fraught with dreams that I derived little benefit therefrom—dreams, delusions and reality were so closely interwoven that even now I cannot tell one from another. Hallucinations of sight were probably present. From the lower ventilator of my room came many animals nightly. These had been rescued from an untimely death by the antivivisectionists. The most formidable of these was a young alligator which gave me quite a shock when he first appeared. The sparrows and cats seen from my window acted "dopey." I concluded they had been fed arsenic as an experiment. The nurses and physicians were recognized as persons I had known, or of whom I had heard. One nurse was Ida Tarbell, in the hospital for the purpose of investigation; another was Ellen Terry, another Sis Hopkins, another a lion tamer from the circus. One of the patients was Hetty Green, also investigating. The nervous mechanism of the eye seemed to be affected. A distinct myopia was present. On only a few occasions did hallucinations of smell appear. Once I smelled burning rubber very distinctly, and on two occasions my room was filled with the perfume of flowers. One patient I imagined had been drinking embalming fluid, and each time she came near me I was nauseated by the odor. My sense of taste was impaired. Food and drink were obnoxious to me. I realized the importance of proper nourishment, however, and forced myself to eat and drink everything that was brought to me. I had fleeting delusions that the food was poisoned, but I still persisted in eating.

The sensation of physical pain which I endured is beyond my powers of description. Every afternoon I was seized by the most violent paroxysm of pain which racked every nerve in my body. The alimentary system throughout felt as though it were one rotten mass. With more or less regularity a convulsion would attack the intestines at about the sigmoid flexure, work its way up the descending colon, across the transverse, down the ascending colon, up through the coils of the small intestines; lessening in force it would attack the stomach, wriggle through the esophagus and disappear. At times during the night the spinal cord would be drawn up so tightly that it seemed like a violin string about to snap. My head would be drawn back and I would rest on my head and heels. By carefully massaging up and down on either side of the spinous process of the vertebræ the tension would gradually be relieved. One night the circulation in my lower extremities seemed to stop. My limbs were paralyzed. This was accompanied by an indescribable

feeling at the base of the spine, and a tingling of the nerve trunks. After much pinching, massaging and manipulation the circulation was again restored. From two until four in the afternoon during the hottest months, it seemed impossible to derive any oxygen from the air. Respiration was labored and painful. From time to time I suffered all the symptoms and complications of every disease known to medical science from exophthalmic goiter to scarlet fever. Carcinoma of the lung was my favorite malady.

Hydrotherapy worked wonders. What I enjoyed most was the shower and spray. It was invigorating and refreshing, and seemed to give me a new lease of life. The packs I disliked at first. The restraint of the blankets around me was maddening, it seemed like a dare, and on several occasions I wriggled myself loose and escaped. However, after I became accustomed to them they were soothing and I frequently slept while being treated in this manner. The continuous bath was restful and quieting. My circulation was poor, and I suffered from cold even in the warmest weather. The continuous bath appeared to restore the circulation, and the warmth was grateful and soothing. The sheet thrown over me in the tub was irritating and worried me constantly. I wanted to be free to splash around as I pleased.

The two things I could not endure were restraint and observation. Had my lot fallen in a hospital where restraint was used I tremble to think what the outcome would have been. Sitting on the porch under the eye of a nurse seemed an unnecessary curtailment of my liberties. Several times I escaped, but was always followed and returned. To have someone watching me was unendurable, inasmuch as I realized in a way how foolish my words and actions were. One night one of the supervisors came in my room and stood for a minute watching me eat my supper. This maddened me so that I threw the tray and all its contents at her head.

The first symptom of recovery was a gradually increasing power to direct my thoughts into desired channels. I discovered that what seemed to be facts were in many cases delusions. Suddenly one day a feeling of self-control returned. The rapidity of thought seemed greatly lessened, and I was once more able to concentrate my mind on one subject for more than a few minutes at a time. Then came the feeling that I was well and must go home. Previous to this I realized my abnormal mental condition, and had no desire to see or be seen by my friends. Now I was seized with an eager longing to see my relatives and friends. It was like coming back from the dead. I overcame my restlessness by cleaning, scrubbing, mending and writing. My brain seemed unusually active and clear. I wrote for hours at a time; essays, poems, aphorisms, etc., flowed from

my pen with great rapidity. I again began to take an interest in my personal appearance, and gradually returned to my normal mental state.

CASE NO. 2. I have suffered all my life from excitements and depressions, although it was not until I was fifty-eight years of age that my family and I realized that I was really insane, and required institutional care.

During youth and middle age my excitements were of a mild character, and during these periods I considered myself normal. I felt peculiarly happy and care free. I managed my household affairs with the greatest ease. I entertained and mingled in society with pleasure and zest. I was lively, talkative and I have reason to believe I was witty and entertaining. I could work without an effort. I at times accomplished almost herculean tasks. On one occasion I remember preparing and conducting a church entertainment by which a sum of \$800 was raised.

Of late years my excitements have grown more severe. I begin by taking an over-active interest in everything going on around me. Everything seems rosy. I feel happy and nothing depresses me. I feel propelled by some unknown force to constant action. I am possessed with the idea of righting wrongs and straightening out things in general. All the faults in the administration of the ward, the hospital and the government must be corrected. For instance, I was at one time told that President Roosevelt was afflicted with the same form of insanity from which I suffer. I thought little of it then, but as my excitement increased I followed his career with the greatest interest, and found much to corroborate this statement. He displayed the same restless energy I felt; he had the same impulse to right wrongs, and the same tendency to interfere in the affairs of others. I finally became thoroughly convinced that he was insane and that it was my duty to inform him of the fact. This I did in a lengthy epistle, in which I advised him to resign his high position in favor of someone who was not afflicted with insanity. I also wrote a similar letter to Congress. About this time the officer who had given me the information was transferred from Washington. I took this to mean that the President had discovered who my informant was, and he was having his revenge. About this time I arrived at the stage where I considered myself perfectly normal. As I was still forced to remain in the hospital, I concluded that the President was to blame. In this manner I built up a set of delusions. My excitements have never led me to commit any acts of violence. I occupy myself largely in talking and writing letters. My room is often in disorder because I cannot stay at one job long enough to complete it. As I feel these excitements approaching, I request the physician in charge of me to take up my parole, as

I know I shall be moved to do and say many foolish things of which I will be ashamed later. No one who has not had experience can realize the mortification of having been insane.

My depressions in early life were as mild as my excitements. The onset was gradual. I felt a disinclination to mingle in society. When forced to do so I sat like a "dummy" and could think of nothing to say. My household duties became a burden. One after another of these were dropped until the care of the household was entirely given over to relatives or servants. I learned from experience a treatment of my own. As soon as I felt a depression approaching, I promptly dropped everything and left home for a time. I found that by getting away from family cares and responsibilities, and from the demands of society, to some quiet spot, I could shorten the duration of these depressions. In recent years the depressions have appeared suddenly. One day I went to town to do some shopping for a friend. I went to a grocery store to make some purchases. It suddenly occurred to me that I could make these to much better advantage at the market only a block away. Suddenly I realized that I did not have sufficient energy to go to the market, and that another depression was upon me. It was with the greatest difficulty that I ordered the goods, paid for them and came home. At these times my brain feels paralyzed. I have not the strength or ambition to do anything. I am apprehensive lest some harm has befallen the members of my family, but to save my life I could not write or telephone to find out if my fears are true. I have the impulse to act, but it seems as if something shuts down and prohibits action. I see my clothes becoming soiled—I know I should change them, but I cannot pull out the drawer of my bureau and get out clean ones. This inertia is greater in the morning than at night. Before I came to the Government Hospital I had servants who slept at home, and came to my house early in the morning. When my husband was away and my children were small it devolved upon me to admit these servants early in the morning. I knew that when morning came, to dress and go downstairs would be impossible. I solved the difficulty by dressing the night before and sleeping in my clothes. When the depression is the most profound I move in a fixed groove. I never vary a hair's breadth. At first I have a desire to remain in bed. Once this is overcome I have no choice but to remain up. I sit in the same seat and in the same attitude for weeks. As I come downstairs in the morning I am apprehensive lest my seat be taken, and I wonder what I shall do if it should be occupied, although the sitting room is well supplied with comfortable seats. I bring a shawl with me, and place it in the chair so that no one will appropriate it while I am at breakfast.

After each depression I suffer from intense pain in my

back, side, shoulders and arms. This is dull and aching in character, and remains with me for weeks after the depression has disappeared. After the last depression I suffered from a severe attack of shingles. The skin eruption has now disappeared, but the pain still remains.

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INTRADURAL CYST OF THE SPINAL MENINGES REMOVED BY OPERATION. RECOVERY OF THE PATIENT

REMARKS ON THE LOCATION OF THE SPINAL CENTERS FOR TESTICULAR SENSIBILITY¹

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The patient is a farmer, aged 42 years, whose previous medical history is negative, with the exception that about eight years before the commencement of his illness he had received a blow on the right side over the tenth, eleventh and twelfth ribs. He was nauseated at the time but did not experience any other bad effects excepting some soreness of the region struck. His habits have always been good.

On December 8, 1909, he was admitted to the German Hospital of Philadelphia, where I saw him by the kindness of Dr. H. F. Page. His complaint at that time was paroxysmal attacks of severe pain in left side and difficulty in walking. His first attack of pain occurred about two years previous to admission, and the attacks have gradually been more frequent and intense since. They usually occurred at night, especially when recumbent, were always on the left side and were felt usually below a line extending from about the twelfth dorsal vertebra to the umbilicus, at times pain was also felt in the hypochondriac region. The pain was so severe, that at times there were spasms of the lumbar muscles on the left side and large doses of morphine and inhalations of chloroform were necessary to control it. At first the paroxysms occurred about once weekly, but when admitted they were occurring every night. The difficulty in walking was first noticed about two months before coming under observation.

The patient was a large, well-developed man weighing 168 lbs. He stated that his normal weight was 180 lbs. His gait was decidedly ataxic, resembling that of tabes dorsalis, and his station was very poor. There was very little if any loss of muscular power in the legs. The abdominal reflex was absent on both sides, the cremaster was absent on the right side, but was present and fairly active on the left. The knee-jerks were much increased on both sides, and the Achilles jerks were present and

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active, but ankle clonus was absent. A Babinski reflex was present in the right side. At the first examination an ill-defined area of hypalgesia and hypesthesia was found on the anterior surface of the right thigh, extending from the groin downward about four inches. This was not found at two subsequent examinations. Both testicles were completely insensitive to either pressure or blows, otherwise there was no sensory paralysis. The heel to knee test was badly performed on both sides and he was unable to appreciate the direction of passive movements of the toes. All other functions were normal, including the sexual. A skiagraph of the spine was negative. An examination of the cerebrospinal fluid showed it to be sterile and to contain a number of small lymphocytes and a few polymorphonuclear leucocytes. There was no evidence of undue tension when it was removed. A diagnosis of probable tumor involving the first lumbar and some of the lower dorsal segments was made and on January 10, 1910, he was operated upon by Dr. Jno. B. Deaver. The laminae from the tenth to the seventh dorsal vertebra were removed. The dura when exposed was of a dark bluish color; it did not pulsate and there seemed to be some swelling. When it was incised a large quantity of fluid escaped. Under the dura on the posterior surface of the cord was a soft, gelatinous mass of yellowish color about one and a half inches long and three quarters of an inch broad. It extended from the first lumbar segment upwards and hence involved also the twelfth and eleventh dorsal segments. It was easily removed, in fact was picked off the cord with the fingers.

The pathological report by Dr. A. O. J. Kelly is as follows: Microscopically all that was recognizable consisted of fibro-cellular tissue. In many places this revealed considerable cellular exudation, and here and there also some endothelial proliferation. Elsewhere there was edematous and myxomatous degeneration, and some foci of hemorrhage. The specimen appeared to be a softening or hemorrhagic cyst. After the operation the patient lost power in the legs and suffered from marked tympanites. The latter cleared up in a few days, but the return of muscular power has been gradual and is not yet complete. He was last seen by me on February 22, 1910; at that time he had had no pain whatever. The knee-jerks were still increased, the Babinski reflex had disappeared and a slight cremaster reflex was present upon the right side (where it had been absent). The heel to knee-jerk was still badly performed and the sensitiveness of the testicles was normal. When last heard from on April 18, 1910, he was able to walk fairly well with the aid of a cane and was improving daily. He had had no pain.²

²Since this was written I have received a letter from the patient's physician Dr. L. M. Kauffman, of Kauffman, Pa., who states that the man is practically well, being able to walk anywhere unassisted, climb stairs, and get into high vehicles without assistance. He has no pain but

Cysts in the spinal meninges are not common, there being 54 or 13 per cent. in the 400 cases analysed by Schlesinger. Of these all but two were of parasitic origin, either *cysticercus* or *echinococcus*. Krauss (1) collected 105 additional cases of tumor of which eleven or not quite 10 per cent. were cysts and of these but four were nonparasitic. One of these was the case reported by Spiller (2) in 1903 of a cyst of the pia arachnoid of apparently idiopathic origin. Since this considerable attention has been given to the subject of such accumulations of fluid in the meninges, or as termed by most authors circumscribed serous meningitis, Mendel and Adler (3), Horsley (4) and Munro (5) having lately reported cases and reviewed the literature. The case above reported, while not identical in that there was an actual growth present, in some respects resembles these cases. It does so in the mild degree, when found, and transitory character of tactile anesthesia and analgesia;³ the character of the pain and the long interval between its onset and the appearance of pressure symptoms, which in this case were milder than in most of those reported, which may be accounted for by the fact that operation was performed soon after their appearance; the tendency to unilaterality of the symptoms, the fact that the location of the pain was partly in the distribution of spinal segments above the location of the lesion, a condition that has been noticed in some of the reported cases; the color and nonpulsation of the dura have been frequently found, as has also the occurrence of an increased cellular content in the cerebrospinal fluid which was present in this case. If we exclude the traumatism of eight years ago, there is no apparent cause for the condition. It differs in the appearance of the lesion; in most of the cases a cyst with such a delicate wall was found that after its evacuation it practically disappeared. In this case there was an actual growth that could be removed. Yet the symptoms as has been above shown were very like those of circumscribed serous meningitis. This would seem to show that the statement made by some that the differential diagnosis between this condition and tumor can always be made is a mistake. In this connection also the statement of

complains of a slight drawing sensation in the abdomen, a sleepy feeling in the feet and a drawing sensation in the back of the legs.

³This would seem to contradict the statement made by Bailey (6) that no tumor of the spinal cord can be diagnosticated with sufficient certainty to justify operation if cutaneous sensibility is intact.

Munro (*loc. cit.*) that in some of his cases the pial membrane was opaque, the cyst could be dissected out and resembled the loose, connective tissue that forms when Schleich's infiltration anesthesia is employed is of interest. It will be remembered that the growth in this case was principally composed of loose connective tissue.

What seems to be the most interesting feature of the case is the fact that an isolated analgesia of the testicles was present and their sensibility returned when the growth was removed. The spinal centers for testicular sensibility are not given in any table of spinal segmental functions with which I am acquainted. Mueller (8) states that the penis and scrotum are innervated by the pudendal nerve, a branch of the sacral plexus, and the testicles receive their sensory fibers from the external spermatic nerve, a branch of the genito-crural, which arises mainly from the first and second lumbar roots. He evidently bases this conclusion upon the fact that in a number of cases in which the sacral segments were affected sensibility of the skin of the scrotum and penis was lost, while that of the testicles was preserved. The segmental localization of testicular pain has also been studied by Head (9) in his well-known studies of the relation of areas of peripheral pain and tenderness to visceral disease. He found in a case of contusion of one of the testicles, cutaneous tenderness in the distribution of the tenth dorsal segment, which disappeared when the testicle was removed. A similar area of tenderness was found in cases of traumatic orchitis. He concludes therefore that the testicle seems to be peculiarly associated with the tenth dorsal segment. In epididymitis cutaneous areas of tenderness were found in those governed by the eleventh and twelfth dorsal segments. This is explained by the connection of the sympathetic nerve with the spinal roots, and it has been supposed by some that the pathway of testicular afferent impulses lies in the hypogastric, spermatic, renal and aortic plexuses. These impulses gain the sympathetic cord by way of the small splanchnic and least splanchnic nerves and from the sympathetic ganglia are transmitted to the tenth, eleventh and twelfth dorsal segments by means of the white rami communicantes. There must also be an afferent pathway through spinal nerves as stated by Mueller (*loc. cit.*), as in a case of the writer's in which there was a tumor involving the conus and cauda equina found at operation, but not

removed, there was analgesia of the testicles. In this case the sympathetic plexuses and nerves could not likely be affected, but it could be due to involvement of the trunks of the lumbar plexus, although there is no loss of tactile sensibility in the distribution of these nerves.

These localizations, *i. e.*, of Mueller and Head are only partly supported by the case now reported. The lesion did not extend as high as the tenth dorsal segment as given by Head, but involved only the eleventh, twelfth dorsal and first lumbar. It also seems probable from this case that more than the first lumbar is concerned as given by Mueller, for this segment was probably less involved than the others, as the cremaster reflex while absent on one side was present on the other; both testicles however were analgesic. This is further substantiated by the observation of Mueller (*loc. cit.*) that the sensory nerves of the lateral part of the scrotum are not derived from the coccygeal plexus, as are those of the median portion, but originate in the upper lumbar segments (ilio-hypogastric and ilio-inguinal nerves). In this case sensibility in all parts of the scrotum was intact, therefore these segments which, according to Mueller, are the spinal centers for testicular sensibility could not have been completely destroyed, as sensibility of the testicles was absent, it seems probable that other segments than those mentioned must take part in the function.

Therefore it seems probable that the spinal centers for testicular sensibility consist of the eleventh, twelfth dorsal and first lumbar segments, the dorsal segments probably receiving their impressions through their connections with the sympathetic system.

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Society Proceedings

AMERICAN NEUROLOGICAL ASSOCIATION

(Continued from p. 509)

Dr. Graeme M. Hammond, of New York, read a paper entitled, "A New Type of Pressure Myelitis."

The description of this disease is based upon the study of seven cases which have come under the author's observation. The pathological conditions seem to consist of the development of an enormous amount of new bone tissue, which is spread over a number of vertebræ and adjacent rib ends, obliterating all articulations and giving the affected vertebræ and ribs the appearance of being one single piece of bone. The development of new bone also occurs within the vertebral canal and gives rise to compression of the cord, causing both sensory and motor symptoms, but eventually leading to the most intense rigidity of the entire voluntary muscular system below the level of the lesion. There was the gradual development of the "Bible back" or forward curvature of the vertebral column seen in spondylose rhizomelique, but in none of the cases was there any evidence of rheumatism.

DISCUSSION

Dr. B. Sachs, of New York, said that Dr. Hammond's presentation of this subject was of interest to him because he has seen a number of cases that have offered some difficulties in diagnosis, particularly difficulty in trying to make the differential diagnosis between such conditions as he described and a simple myelitis. Within the last few months he has had at Mt. Sinai Hospital, New York, two cases of absolute spinal rigidity, and an x-ray picture was taken in one case at any rate and showed a condition very much like the one presented by Dr. Hammond. In the case Dr. Sachs referred to, a man of about 35, the rigidity of the spinal column was absolute from the third or fourth cervical vertebra to the very end, and in fact in this case there was no movement possible of the body, except slight movement of the head forward on the chin, a slight lateral movement of both sides. Otherwise the patient was so rigid (he is now bed ridden, at the time Dr. Sachs first saw him he was able to sit up a little) that he could only sit up in a chair by having it put at a definite angle. In this case the symptoms were much more pronounced than in Dr. Hammond's case. There were extreme contractures and extreme atrophies. The man as he now lies in bed has his knees so completely contracted that you can hardly put a hand between the posterior surface of the thigh and the posterior surface of the calf, the legs are locked together and there is absolutely no motion of any part of the leg, except of the toes. He has a little voluntary motion of the toes. The atrophy is more extreme than Dr. Sachs has ever seen it in any case of ordinary spinal origin. There is hardly a bit of tissue left, when you press the skin it seems as if you had the bone in the hand. All the subcutaneous tissues are atrophied and there is literally nothing but skin and bone left. You could not pick up a muscle and prove that you had a

muscle in your hand. So far as the diagnosis was concerned he was not ready to concede that Dr. Hammond had described an entirely new type of disease, although he did not want to deprive Dr. Hammond of the honor if he could prove it. Dr. Sachs thought these cases were closely related to the spondylose rhizomelique type. The case he alluded to in his practice had the shoulder joint involved. The general resemblance to spondylose rhizomelique seemed rather close, except that all atrophies were more marked than in those cases. What the nature of the process is if it is not originally rheumatic it would be very difficult to say. We can at all events claim that there must have been originally some inflammatory process and those spicules of bone Dr. Hammond described were in the nature of osteophytic spicules of inflammatory origin, and we cannot get away altogether from the idea of an intense inflammatory process which has given rise to obliteration of intervertebral bodies, cartilage, ligament, so that all structures have become ossified. In the second patient in whom the disease was in its beginnings, there were intense pain and symptoms pointing to the mid-dorsal region. There was already complete stiffness of the spine and with every movement a great deal of pain, so that Dr. Sachs regarded this case as being in the initial stages in which probably the inflammatory element was very much more distinct than in those more chronic cases. He was very glad that Dr. Hammond had brought those cases before the Association. He did not think that our knowledge on the subject was distinct at all, and it would encourage us to look very much more often for changes in the vertebræ than we are accustomed to look. He hoped that in all the cases of mysterious spinal cord disease an x-ray picture would be taken.

Dr. William G. Spiller, of Philadelphia, said he had not quite understood from Dr. Hammond the distinction between the type he had described and that von Bechterew described; von Bechterew made a distinct difference between his form and that of Marie. There are in this connection two other kinds of disease. Eight or ten years ago Dr. Mills and Dr. Spiller reported a case of a man paralysed and with much spasticity of the limbs. They found that the dura was firmly adherent to the bodies of the vertebræ throughout the whole course of the spinal canal, and in removing the cord it had to be cut away inch by inch. In the past winter Dr. Spiller had a patient who developed paralysis and exaggerated reflexes of his lower limbs. The disease gradually progressed upwards, involving first one upper limb and then the other, and the duration of the disease was only a few weeks. Dr. Spiller found a tumor growth on the outside of the dura, which under the microscope resembled endothelioma. This is the first case he has seen of widespread endothelioma developing primarily between the dura and the bodies of the vertebræ.

TUMOR OF THE PITUITARY BODY SUCCESSFULLY REMOVED

By Hugh T. Patrick, M.D.

Dr. Patrick showed a patient from whom a tumor of the hypophysis had been removed. The patient had blurred discs, not choked discs, and typical hemianopsia. X-rays showed enlarged sella turcica. There was slight mental hebetude. Last June Dr. Patrick made the diagnosis and Dr. Albert E. Halstead was called upon to operate. He removed the hypophysis, the man made an excellent recovery without even a visible

scar, and his vision, which had almost disappeared, returned in a very large measure. He had been able to see very faintly: for instance, the face of an individual looked like a blurred white object, and now he is able to read a newspaper. The severe headaches, the low-grade optic neuritis and other general symptoms had disappeared.

Dr. Albert E. Halsted said that in operating on the patient he had followed the usual preparation. The anesthetic was started with ether. A high tracheotomy was done and a Trendelenburg balloon canula inserted. Chloroform was now used for the anesthetic. The nasal cavities were packed with adrenalin gauze and the pharynx tamponed. The upper lip was raised and an incision made in its mucous membrane about five sixths of an inch from the muco-cutaneous junction, and parallel to the alveolar process. The soft tissues were freed and the nose gradually drawn up with retractors. The septum was divided with bone forceps, and displaced upwards and laterally. The lower turbinates, the vomer, and the perpendicular plate of the ethmoid were removed. At a previous operation, at the Illinois Charitable Eye and Ear Infirmary, the middle turbinates had been removed by Dr. Norval H. Pierce. An opening was then made through the anterior wall of the sphenoidal sinus and a blue-colored pulsating mass seen. The membrane covering the tumor protruding into the opening in the sphenoid was incised. The tumor was then curetted out with a dull curette. The whole cavity, now the shape of a cylinder, one inch in diameter and five inches long, was thoroughly flushed with normal salt solution and subsequently packed with iodoform gauze. The septum was sutured back, and the mucous membrane of the mouth replaced and sutured, and the tracheotomy tube removed.

During the first forty-eight hours the patient's temperature varied from 100° to 102°, rectally, and the pulse from 100 to 120. His condition was fair, his mind clear, and he was free from pain. At the end of forty-eight hours the packing was removed and replaced immediately by the senior house surgeon. Following the repacking of the cavity the temperature rapidly rose until it reached 105°, with a pulse of 160. The patient became somnolent and could only be aroused with difficulty. This condition lasted for twenty-four hours. Upon removing the gauze pack and irrigating the cavity, the temperature fell rapidly until, at the beginning of the fourth day, his temperature reached normal, and from that time on no untoward symptoms developed. The patient left the hospital at the end of five weeks, free from pain, and with marked improvement in the vision. The right eye was 4/200 before operation, and at the end of the second week after operation it was 6/15; left eye was 5/200 before operation, and 6/22 after the operation. He continued to improve, resuming his occupation as driver of an express wagon on the first of December, and since that time has enjoyed good health.

Dr. James J. Putnam, of Boston, narrated the case of a young man, somewhat small in growth and with a temporal hemianopsia and an almost complete loss of sight. He was under the care of Dr. Alexander Quackenboss and was seen in consultation. The diagnosis was made of tumor of the hypophysis and the x-rays showed a large sella turcica, a condition which, very fortunately for the operator, not infrequently is present. Dr. S. J. Mixter operated. An incision was made following the contours of the *alae nasi* and respiration was carried on by a tube passed down into the trachea. The tumor proved to be a cyst containing 1½ ounces of fluid. The patient made a complete surgical recovery. His

eyesight had been restored almost to normal, although considerable atrophy of the optic nerve had taken place.

Dr. J. K. Mitchell, of Philadelphia, read a paper entitled, "Myositis Ossificans." (*See this Journal, p. 547.*)

Dr. William Spiller, of Philadelphia, read a paper entitled "Friedreich's Ataxia." (*See this Journal, p. 411.*)

DISCUSSION

Dr. Charles K. Mills, of Philadelphia, said that we sometimes have criticisms on the methods of work of members of the American Neurological Association; that he had heard much in the open meeting or elsewhere, about the unwisdom of reporting single cases before a body like this. It seemed to him that such a criticism was often not justifiable. It is a foolish thing perhaps to report isolated cases which present nothing new or valuable, but the report of a case of this kind thoroughly studied in all its features, is one that enables us to fill in certain gaps and to arrive at certain conclusions with regard to matters of the greatest importance in neurology. Some years ago the question of the unity of the psychoses came before us in a very prominent way, and some were inclined to question much that was said of those who advocated this doctrine, but much has come out of that method of considering the subject. The paper of Dr. Spiller was to Dr. Mills chiefly valuable for one of the things indicated in the presentation of it, and that was for the cause of its additions to our knowledge of the unity of the embryonal diseases, like Friedreich's ataxia, the dystrophies, etc.

Dr. Sidney I. Schwab, of St. Louis, inquired regarding a syphilitic etiology.

Dr. E. W. Taylor, of Boston, stated that in a series of sections from a case of Friedreich's ataxia which he had had an opportunity of studying there was a strikingly clear degeneration of the cerebellar tract and of Gowers' tract which he took to be part of a widespread degeneration, extending throughout the nervous system. Dr. Taylor asked whether Dr. Spiller had been able to trace such a degeneration of Gowers' tract into the cerebellum, and whether anything had been done by this means toward determining the termination of Gowers' tract and the direct cerebellar tract.

Dr. B. Sachs, of New York, said he would like to add to what Dr. Mills had said on the work done by Dr. Spiller. He thought the attitude of some of the men in decrying single case reports was a mistake. It makes all the difference whether the case was reported clinically or clinically and pathologically. The important thing is to work up the case in such a way that deductions may be made therefrom. Any such study as presented by Dr. Spiller was of the greatest possible importance and he trusted that work of that sort would go on and be reported more frequently than hitherto. Dr. Sachs spoke of the question of endeavoring to explain the hereditary family diseases in connection with the modern laws of heredity. The attempt will have to be made some day and even though our first steps may be very unsatisfactory we should make a beginning. Dr. Sachs said he was particularly interested in hereditary ataxia because next to amaurotic family idiocy it was the most pronounced hereditary affection of the nervous system. In hereditary ataxia we evidently have an involvement chiefly of spinal tracts, as Dr. Spiller has so

well shown, and Dr. Sachs had no doubt, too, in those cases there was some cellular involvement as well. In amaurotic family idiocy, the disease process affects the nerve cells only. Some years ago these cases were spoken of as cases of arrested development. The biologists are not satisfied with that term, particularly if the symptoms come on later in life after normal birth, and so on. These family diseases would not occur if there were not some vital defect in the germ plasma. That vital defect makes the organism less resistant to extraneous influences or to influences within the body than they would be if this vital defect in the germ plasma did not exist. In former days Dr. Sachs was absolutely opposed to the idea that any family disease could be due to any toxic or infectious agent. He does not believe that any family disease can be due to an extraneous toxic or infectious agent, but an infectious agent that is formed within the body itself is conceivable, particularly if one allows that the injury done to the germ plasma in the first place makes the various structures of the body less resistant to poison formed within the body itself. That is the one step forward that we are able to take in the matter of explaining some of the family diseases.

Dr. Spiller, in closing, said that the Wassermann reaction was not taken, as he had not had the opportunity to study the case during the lifetime of the patient; however, there were no symptoms or lesions suggesting syphilis. In reply to Dr. Taylor's question, Gowers' tract in this case was not degenerated, or if so no sclerosis had replaced the degenerated fibers. In many cases of Friedreich's ataxia this tract has been found degenerated. Dr. Spiller said he was opposed to the reporting of individual cases unless important information was to be derived from such a report. Cellular changes are not usually found in Friedreich's ataxia, according to most investigators.

Dr. James J. Putnam, of Boston, read a paper entitled, "Personal Experience with Freud's Analytic Method." (*To be published in this Journal.*)

DISCUSSION

Dr. George L. Walton, of Boston, expressed the wish that Dante could open this discussion and let us know whether, when he credited Desire with being the root of all things good and evil, he had in mind unconscious memory pictures, as of dreams, to which branch of the subject Dr. Walton confined himself. Without venturing to offer a complete explanation of the dream, he felt justified in assuming that it consisted of a series of concepts previously entertained but newly assembled, succeeding each other, sometimes with lightning-like rapidity. One important difference between these memory pictures and those of the waking life, is the inability of the dreamer to measure time and space; but the main distinction lies, perhaps, in the absence of goal ideas and of the power of control which enables us in our waking hours to guide our thoughts more or less successfully in definite channels.

The associations by which these pictures are assembled will vary with the individual and be tinged by his emotional tone, but to read into them, however ingeniously, the fulfilment of desires is to strain a point, and to substitute a preconceived notion for the study of facts. Dr. Walton found it hard seriously to discuss Freud's illustrative case of a child of tender years who sleeps in a very large bed and dreams he is in a tight place. This dream Freud explains as the fulfilment of the child's wish

to be large, a wish so abundantly fulfilled that he thinks himself so large that even this bed is too small for him.

To credit mere memory pictures, distorted at that, with being symbols is unduly to glorify the dream state—he should perhaps rather say unduly to debase it, when the symbols are of the character which permeates the works of this author.

At the risk of seeming prejudiced, he found himself disinclined to follow a leader who ascribed a sexual symbolism to such innocent objects as blossoms and branches of trees.

The reproduction of a dream in detail, and its analysis, is not only baffling and valueless, in his opinion, for medical practice, but may be harmful. Sholtze says that children should not be encouraged to relate their dreams, for their already fantastic imaginations will thereby be the more led away from the real things of life. Similarly, in the treatment of the psychoneurotic, the desideratum is concentration upon the external and the real. As to the comparison between getting up and doing something and analyzing the dream, it seemed to him that an ounce of Muldoon is worth a pound of Freud.

Dr. Edward B. Angell, of Rochester, N. Y., agreed with Dr. Walton. He thought these parasitic ideas need ruthless treatment and should not be cultivated. He recalled a patient sent to him, a woman whom he made to sit up, every time the doubts came upon her and to say out loud, "What a damn fool I am!" Two treatments of that sort served to relieve the whole chain of morbid ideation.

Dr. B. Sachs, of New York, said he desired to be absolutely impartial in this matter out of respect for the reader of the paper. He would agree with anything said by Freud with special delight if he could feel that his teachings were absolutely sound. There are several practical reasons why they do not appeal to Dr. Sachs; the first counts least, that is the length of time the examination takes and the smallness of the result. The method is an impractical one for that reason, though he was willing to concede that this feature might be overlooked in case the investigator were willing to give the time to it. The most serious objection to the method is that it has had a distinct sexual taint given it. It may be of great interest to the neurologist to find out that some sexual misconception or some disagreeable sexual thought had existed in a certain person in early years, and while it may be of great interest to the physician, and may not do a woman of 40 years any harm to have her psychic analysis made as carefully as Dr. Putnam has performed it, it was Dr. Sachs' firm conviction that we do no good by taking a young man or woman of fourteen to twenty years and directing his or her thought back to that one sexual mistake, of which he or she may have been unconscious. The older methods were more satisfactory and more decent.

Dr. Charles L. Dana, of New York, said that he would welcome any new method that would help us in treating the difficult class of cases for which it is claimed to be efficient. It carried much weight that Dr. Putnam had used Freud's method and found some real good in it. Dr. Dana's practical experience had however been not only of failure, but sometimes of disaster with this method. The taking of an educated, refined and delicate minded woman and making her go through elaborate details of early emotional experiences had sometimes stirred up a mass of old memories, and thrown the patient into almost delirium of distress. The speaker had practically stopped giving any such treatment in cases of at

least the better educated and intelligent type of patient. In dispensary practice there had been rather more scope for the method. This was the situation as the speaker saw it at the present time. In cases of psychoneuroses he found by the ordinary methods of treatment, by using the resources of modern therapeutics, that recovery occurred. A certain number of these cases run a course, and recovery results in one or two years whether anything is done or not, if they are in proper environment. The more serious cases which date back to early life, he had not been able to do much with. If the method of Freud will successfully help them it will be a distinct addition to our resources, but the speaker did not see exactly how any method could help a condition which is essentially constitutional. Instead of the Freud method, the quickest way of getting at the inside of the situation in the psycho-neuroses is to do what we practically all try to do, viz., take these patients and put them in a private hospital, give them an intelligent nurse, see them often, send persons who are intelligent women or men to give them treatment, and by every process possible become acquainted with their story. In two or three weeks one in this way learns about these patients, and their past history. The speaker believed that one can get more in this way than by the Freud method. There was perhaps a certain small group which the Freud method helped.

Dr. L. F. Barker, of Baltimore, said it had been his good or bad fortune to see a good many of these patients in the last few years. He had been much interested in this discussion. Any method which helps us to understand the nature of these cases and treat them successfully should be welcome. He was very glad indeed that so fine a man as Dr. Putnam should undertake this study—the practical testing of Freud's method. It seemed to him that the method should be tested by a man in whom we have absolute confidence, whose ethical nature is such that we could have no doubt of the motives of the study or its character. Dr. Barker thought the method should be carefully tested. It had excited world wide interest and some of the better psychologists have become very enthusiastic about it and so express themselves. It is too early to say how much good will come of the psycho-analytic method of study, but certainly a large amount of new knowledge concerning the minds of psychoneurotic patients and the psychology of life generally, is being derived from these studies. He thought we should separate the method of psycho-analysis from the purely sexual idea. A great deal of information may be obtained by the use of the psycho-analytical method entirely outside the sexual sphere. He stated that in the limited application of psycho-analysis he himself had thus far made he had been distinctly helped, especially in extending the anamnesis and in determining types. It is often difficult to get at the patient's personality in the psychoneuroses, but with the aid of association-tests one can more quickly get at its kernel. He recalled one woman who thought she had told him everything, who in a few days gave him a history (1) of the fact that she was an illegitimate child, and, (2) that she had once kept her husband from shooting himself, facts that had been important influences in the life of the patient.

As to psychasthenic cases, and he thought the cases Dr. Putnam referred to came in that group, his experience with them is that many of them are hereditarily badly endowed people. They start badly. He had in mind some patients under his care in whose families for three generations at least, psychasthenia had existed. His experience is that a psy-

chasthenic individual usually has several attacks in his or her lifetime. These attacks last for a variable time. When you find the patient attacked in middle life you are pretty sure on inquiry to get a history of one, two or three such psychasthenic states in earlier life. An attack may be precipitated by a strain, for instance that of an engagement, or of a great illness. Many patients get "well" after a while, no matter what you do, as long as they are put in good surroundings. He thought the cure could be hurried by making the surroundings good and by educational measures. The symptoms are independent of the will and of the morality of the patient. They come out because of the state of the nervous system. While he was thoroughly convinced of the importance of the psychogenetic influence in the later psychic life of the patient, the original false ideas are probably dependent upon some imperfection of the physiological functions of the cerebral cells. He would not be inclined to charge all the difficulties of the patient to an original abnormal idea; he thought rather that the early disturbing ideas were due to a disease of the nervous system—a disease of the cerebral cortex. He thought it likely that attempts at interpretation on the part of the patients are harmful in psychasthenia just as we know that they are in the psychoses. If a patient once has an acute cerebral attack he may have certain psychic experiences which are very peculiar to him; later he tries to explain these peculiar experiences; thus arise the well-known "explanation-delusions" of the psychotic. We are now able to do a great deal to help these psychoneurotic people; a large part of the work of neurologists consists in trying to make these people well and we ought to try to get them well. He is inclined to think, however, that the psychasthenic nervous system may be Mendelian in origin, that we have to do with a Mendelian "presence" or "absence." We are not going to get rid of psychasthenia by treating the individual cases; we are on the contrary likely to perpetuate the disease because "cured" psychasthenics are more likely than others to become parents and to beget their kind. By all means let us comfort them and help them in every way possible, but let us prevent, at any rate the more seriously affected of them from becoming the parents of children. This will require a campaign of education of the public along eugenic lines. That is the way to attack the problem at the root. If psychasthenics become the parents of children the latter are only too likely to develop at some time in life psychasthenic states.

Dr. Charles K. Mills, of Philadelphia, said that hearing what had been said by Dr. Dana and Dr. Barker so well expressed his own views in regard to Dr. Putnam's paper that there was little left to be said. He thought we owed a debt to a man like Dr. Putnam for the manner in which he had approached and attempted to develop this subject. However, he must confess that he was not altogether in accord with Dr. Putnam's views. One thing he noted also, not only in Dr. Putnam's own report of results, but in the reports of others, that they have not been altogether satisfactory. Even those cases which Dr. Putnam reports today, did not seem to Dr. Mills as records of cure of a better sort than those which have been recorded by other methods of treatment. Not a few of these cases have a tendency, so far as the acute conditions are concerned, to terminate by a species of limitation. Improvement, it is true, has been recorded by Dr. Putnam. Few cases have been recorded in which absolute cures have resulted from the self-analyzing treatment. There are dangers in this method. Dr. Putnam used the illustration of a general

and his army in the wilderness. The general and his army in the wilderness did get out of the tangle, and did get to Richmond. Perhaps nothing could have been more dangerous, nothing perhaps could have done more harm to the individual components of the army, than for them to have known their own weakness. It was well enough for the general to know the weakness of his enemies, and of his own force, but part of any good which may have come out of the difficulty was due to the fact that the men under him did not apply to themselves any method of psycho-analysis. One thing which can be said in regard to this method is that anything that reasonably improves our ordinary methods of arriving at the real etiology of affections of the sort under consideration, is to be approved. After all it is that which is congenitally inherent, and has been referred to by Dr. Barker. That is the most important matter in these cases. Largely the old methods, the methods that we have all employed, with some additions from the work of Dr. Putnam and others, will give the best results.

Dr. Hugh T. Patrick, of Chicago, remarked that Dr. Putnam's method appeared not to differ so very much from the ordinary methods of psycho-analysis. Not being a veteran of the Civil War he could not eloquently speak of the battle in the Wilderness, but he had had several other battles in several wildernesses as he supposed we all have had. He believed that psycho-analysis, or whatever leads us back to the definite original cause of any phenomenon in the abnormal patient, or to the beginning of what has been a series of abnormal phenomena, is of great value. To take an ordinary, elementary illustration: a case of agoraphobia. The patient's initial illness started with an attack of ptomaine poisoning with weakness, diarrhea and loss of consciousness in a restaurant. Subsequently he practically forgot these incidents. In his attacks of agoraphobia he did not formally recognize why he was afraid nor why he was worse in a restaurant. He had a number of psychical phenomena for which he had no interpretation. Obviously it was wholesome to trace his condition to the original attack, to show him why he was frightened, why he had felt so subsequently. Now, there is nothing in this procedure that seems closely related to Freud's psycho-analysis. This seems to be simply common sense. But, by the use of 100 test words, if by communing with the patient in the recumbent or any other posture we can lead back to the initial cause of abnormal phenomena, we accomplish our end and the first step toward recovery. What he believes to be distinctly injurious is to encourage the patient to probe and question himself when he is by himself, without the control and leading intelligence of his physician.

We all know that patients generally are unable to observe facts without forming opinions, to study phenomena without interpretation, and it is particularly these neurotic, poorly balanced, hypersensitive, introspective, self-centered people who are constantly drawing wrong conclusions, consciously or subconsciously. Dr. Patrick said he didn't like the subconscious business very well; it seemed to be overworked. In so far, then, as the Freud method encourages self-study and self-analysis, Dr. Patrick was afraid of it. He knows of one very intelligent, highly strung, sensitive young man sent to Jung. He was distinctly helped in one respect but in Dr. Patrick's opinion distinctly harmed in another. This young man after returning had various battles, the nature of which he perverted and the importance of which he exaggerated, because of his auto-psycho-analysis. One day he announced to his physician that he had discovered that this subconscious ego, this demon, was essentially polygamous. If

that young man had been shown, what is knowledge common to all of us, that all men are essentially polygamous, and why, it would have helped him; but to come to this deduction by semi-mysterious self-analysis, by probing back into past desires and experiences, by exploring the subconscious was distinctly injurious.

Dr. Alfred Reginald Allen, of Philadelphia, recalled that Dr. Dana said most of these patients get well if let alone. No doubt one sees cases that have been the rounds, having been treated by neurologists in a routine way and well treated, too, and without much improvement. Dr. Allen said he had in mind a case in Dr. Mitchell's practice; the patient had been to many neurologists from the Pacific coast to the Atlantic, he was a hopeless neurasthenic and had a great prolapse of his rectum which had been recorded as the exciting cause. Dr. Allen treated that condition for some time under Dr. Mitchell. It was not until Dr. Allen had been studying the case for weeks that he was able to unearth in the patient's past life not a sexual question at all, but a question of rather an interesting blackmail. He fully agreed that Freud's method is a valuable therapeutic means, as training the guns on that old origin cleared the case up.

Dr. Augustus A. Eshner, of Philadelphia, said that it should be borne in mind that these patients are already unduly subjective and introspective, and that care should be taken not to make them more so as a result of a certain form of interrogation. Herein appears to reside a danger entitled to serious consideration.

Dr. Harold N. Moyer, of Chicago, said it seemed to him that the relation was very far apart in all this discussion. He announced himself a disciple of Putnam rather than of Freud. Anyone who undertakes to practice Freud's analysis upon his patients on their first visit to the office will not have any patients. That is obvious. The older methods are to be adhered to for a certain time. As to the psycho-analysis of impotence the physician who neglects to look for some prostatic trouble or stricture will go amiss. This discussion has brought out, as stated by Dr. Dana, and admitted by Dr. Walton, that the old methods are efficient. The Freud method is an efficient method of getting at a few cases that we have never reached before it was offered to us.

Dr. Philip Coombs Knapp, of Boston, stated that on the first appearance of Freud's work he began to try Freud's method. There is one radical defect in Freud's general position which has not been touched upon. We see almost every day cases of nervous disturbance of one sort or another due clearly and confessedly to some pronounced emotional disturbance. The cases improve as the emotional disturbance is put into the background and forgotten. It did not seem always to be a reasonable method of treatment in those cases which are due to a forgotten emotional disturbance pushed back into the subconsciousness, to drag that once more into the field and get the patient to dwell upon it. Certainly in the cases due to a conscious emotional disturbance if we sit down and harrow up the patient's feelings again in regard to that emotion we may reproduce the nervous disorder. It seemed to him that that was the primary unreasonableness in Freud's theory. The dangers have been dwelt upon, but knowing Dr. Putnam's invincible optimism, his propensity always to discover the precious jewel in the head of the ugliest and most venomous toad, Dr. Knapp said he felt that Dr. Putnam had thoroughly disinfected Freud's methods in his own cases. He felt that a word should be said on the methods. They take an enormous amount of time,—he recalled one

case where an enthusiastic assistant passed a number of hours with a patient for several days, to be informed of what she had told Dr. Knapp when she first came into the room—and in both instances the facts elicited were pure fabrications. There is a tendency to consider the data as derived from the psycho-analytic methods as being absolute and accurate. Dr. Knapp had not always found them so. He has found these tests repeatedly contradictory and untrustworthy. After reading Freud's or Napoleon's Dream Book he could not help recalling those most learned and ponderous volumes published by most erudite divines in the past, who attempted to interpret that beautiful erotic poem of the Hebrews, the Song of Songs, as a pure allegory suitable for a young ladies boarding school, depicting merely the mystical relations of Christ and his Church.

Dr. Ernest Jones, of Toronto, Ontario, asked leave to make a few general remarks, as so many individual points had been raised that it was impossible to answer them in detail. He would refer to only one of these, namely the one raised by Dr. Dana as to the actual value of the results obtained by the psycho-analytic method. All the members of the Freud school had for years practised with the usual forms of psycho-therapy, suggestion, persuasion, hypnotism and so on, and their experience was quite unequivocal as to the vastly better results given by the psycho-analytic method.

Dr. Jones urged that it was desirable to be more conscious in formulating one's attitude towards Freud's views than in smaller matters, for both the supporters and opponents of these views were unanimous on one point, namely, that if they were true they were highly important, not only to neurology, but also to sociology, psychology and other sciences. The history of new movements in the advance of knowledge showed us that they had invariably been met with blind opposition and prejudice, and it is time that we learnt a lesson from history so as to avoid similar errors in the future. In many cases the opposition had been temporarily or lastingly fatal, with grave consequences to the welfare of humanity. The persecution dealt out to Semmelweis and Elliotson delayed for fifty years the advent of aseptic surgery and of clinical psychology respectively, and thus prevented the alleviation of an incalculable amount of suffering. In the case, therefore, of a progressive movement bearing the high credentials that the Freudian one does, we should attempt to deal with our natural resistance to the new, and realize the serious responsibility of attempting to cripple, without preliminary investigation, a movement that might be fraught with good. Still, no opposition could now crush Freudism; that might perhaps have been possible fifteen years ago, but it was now too late, for the movement had already attained such dimensions that the most that opposition could now do was slightly to delay its advent. There was now an important International Society for Psycho-analysis, with five sub-sections: there were some two hundred trained workers who had confirmed Freud's conclusions in most of the countries of Europe: there were four periodicals exclusively devoted to the work, not to speak of a mass of literature that had appeared on it in the special journals. The objections that had been brought forward were merely excuses and pretexts to cover the underlying unreasoning resistance, and could all easily be answered by a little first-hand experience. There were only three or four men in America with the necessary training in the method to give them the right to criticise it. Actual experience was the only criterion that could decide such problems, for experience is the basis of all

science. America, the land of liberty, was famed among the nations for the openness with which she welcomed new ideas; American neurologists had now a great opportunity to uphold this reputation.

Dr. James Putnam, in closing, stated that he thanked the members very much for being willing to discuss his paper. He said this with a great deal of feeling because he confessed it had taken a little courage in a person not particularly courageous to bring the subject forward. He had done so for a somewhat special reason. It had long been obvious to him and to others that there has been a division of sentiment in this association due to an increasing interest in psychological inquiries, an interest really present from the foundation of the association and represented then by Dr. Beard. There have been certain members who have been moved to emphasize the functional aspects of neurology and others who have preferred to study its anatomical aspects. The formation yesterday of our new Psychopathological Association simply marks the further development of the former of these tendencies. This division of emphasis is very fortunate but it is undesirable that we should go on with a growing sort of antagonism and failure to understand each other's position about important questions, and therefore Dr. Putnam had decided to read upon this unpopular subject of the Freud methods in the hope that it might help to start a friendly discussion not only on this subject but about more such matters of common interest to us all. In Dr. Putnam's opinion it is not Freud and his attitude and views that should be considered as on trial, but the attitude of his critics. Professor Freud is one of the ablest and most intelligent physicians in Europe, and one of the most honest and conscientious. His attitude towards this question used to be practically the same as the attitude of the various gentlemen who have spoken today adversely to his views. His present position is not due to facts which he invented. His view has been called by Dr. Knapp a hypothesis. It was never a hypothesis. It was a generalization based upon observation. The facts forced themselves upon his notice. He took them up in a thoroughly conscientious way, and then dealt with them in an extraordinarily broad and scientific spirit, collated together with a thoroughness which no one who has not investigated the matter can conceive. There are various other methods of treating these psychoneurotic maladies, but who can say they are sufficient. We have an excellent method of treating syphilis, with iodides and mercury, but we should be glad enough to obtain another and if it could be proved that arsenic could be profitably and safely used, as many persons think, we should all be entirely willing to believe it. Dr. Sachs had said he was sorry to say that Freud had given up the method of studying the nervous system which he had been carrying on at the laboratory of Meynert. Dr. Putnam said he did not know why he should be sorry to say that. The mind has an anatomy and physiology as well as the body, and if we choose to neglect the physiology of the mind we do it at the cost of our own liberality and scientific knowledge as well as at the cost of our patients' health. There is a great deal of misunderstanding as to this sexual question and our mode of dealing with it. One does not take a young unmarried girl and begin to talk to her bluntly and tactlessly about her sexual relations as has been suggested. It would be very extraordinary if any one should do that. If sexual ideas come out it is because the patient brings them out. That Freud has always contended. It is our false and obsessional prudery that makes this seem wrong. If one had to summarize the value of this method from the therapeutic side the

only word that fits the case is "education." Dr. Putnam could not conceive how any one who looked fairly at the facts could do otherwise than believe that a man who had spent years in trying to bring about the particular sort of education which is necessary for these serious cases can do otherwise than do good.

Dr. Walton had alluded to an assumed young lady who had been reading prurient passages in Freud's *Traumdeutung*. Does Dr. Walton suppose that that young lady had formed her first inclination towards prurient literature by reading this book, which but few persons in this room had read and which even good students find it hard to understand? Does he even think she could have read Freud's book in a prurient spirit after she had been educated by Freud? He ventured to say that in that case her imagination would have been changed and she would have learned to see her sexual experiences in a wholly different light and therefore to be governed by them in a wholly different way. Dr. Walton himself has brought out an excellent and world-renowned book entitled: "Why Worry," but it would seem to be almost a cynicism to say to a psychopathic invalid "Why worry" without ever putting the further question, "Why do you worry?"

Dr. Mills had spoken of the cruelty of trying to urge patients into reviewing painful experiences. But the real cruelty lies in urging them to face their painful symptoms without explaining to them the nature of the enemy they have to meet. Of course as regards the needed length of time to which Dr. Sachs referred, that is a criticism not against the method, those who do not choose to spend the time, need not. We all of us spend vast amounts of time in studying the anatomy of the nervous system and we are devoting ourselves to this study, to the anatomy of the mind. One is quite as justifiable as the other. Then again the persons who speak as though the sexual thought were brought out in these patients' minds, as Dr. Knapp says, have failed to recognize, and this struck Dr. Patrick, with a certain amount of feeling about the subconscious which he doesn't like. He fails to realize they are suffering from these thoughts, they don't give them names and these symptoms reveal their state, it is not to dwell on sexual thoughts, but to relieve their minds from sexual thought which in another form was active and producing symptoms that the whole treatment is indicated. Dr. Barker spoke with extreme balance on the whole subject and Dr. Putnam agreed with almost everything he said. It is feared that a hereditary influence is at work on these cases. All the more we should do all we can to counteract it. This treatment adds a little more. The question of marriage is a thing to be spoken of. Assuming you have got to consider whether a patient will restrain himself from getting married or suppose you think he ought to, or that he ought to overcome some serious tendencies which he has, is there any other method of doing it except by some method of education? All men go through a good deal the same process. He recognizes what happens as what he calls sublimation, they become worried, usually over normal instincts and they learn to express them on a far higher plane. That is what we all do. We all have sexual instincts, instincts of hunger, etc., as children and we learn to express them on a higher plane, that is development and education. If these neurotic patients have got to make some serious renunciation they need the best sort of support and education.

Dr. Mills spoke of the results, the cure. The cure is brought about as by any other work. So as to Dr. Patrick's objection to the patient probing

himself, it is injurious to probe himself alone and it is to prevent the patient doing this that he is encouraged to probe himself before the physician, he probes himself alone from morning to night otherwise, and it is to make it impossible for him to do that that we use this treatment.

DEMENTIA PRÆCOX SYMPOSIUM

A paper by Dr. Smith Ely Jelliffe, of New York, "Predementia Præcox: The Hereditary and Constitutional Factors of the Dementia Præcox Makeup," was read by title.

Dr. Adolf Meyer, of Baltimore, read a paper entitled: "The General Conception of Dementia Præcox."

1. The disorders which unquestionably denote pertinence to the dementia præcox group. Leaving out the questionable states which form a margin of perhaps 25 per cent., there remain: the paranoid, catatonic and scattered dissociative processes. Their essential features. The non-mental characteristics.

2. The functional constellations to be considered in psychopathology: (1) Psychogenic or mental conflicts. (2) Submental conflicts—toxic, focal.

3. Directions of analysis and reconstruction: (a) Metabolism and toxic states. (b) The neurological data. (c) The scope of psychogenic events, and the submental implications.

4. General summing up of what dementia præcox represents nosologically.

Dr. August Hoch, of New York City, read a paper entitled, "The Mental Mechanisms in Dementia Præcox."

Report of a psychoanalysis in a case of dementia præcox, showing the development and the mechanisms of the symptoms; discussion of psychological mechanisms underlying the symptoms of dementia præcox in general.

DISCUSSION

Dr. Hugh T. Patrick said that if he hadn't heard another word of scientific papers these would have more than repaid him for coming on from Chicago.

Dr. E. E. Southard read a paper upon "A Study of Errors in the Diagnosis of Mental Disease."

The paper endeavors to establish the degree of accuracy in the diagnosis of mental disease at the daily clinics of the Danvers State Hospital, Hathorne, Mass., during the years 1904-1908.

Two hundred and forty-seven cases introduced in these clinics and later coming to autopsy form the basis of the report.

DISCUSSION

Dr. Cotton, of Trenton, N. J., said of course the question of error is one that is very important and error in diagnosis cannot always be averted, but at Trenton they find that by presenting the cases twice at staff meeting the errors have been reduced very much. That is they have a preliminary presentation of the case, and within a month the case is presented again, and any time after that the diagnosis warrants it. They take up the cases that come to autopsy, correlate them with the clinical diagnosis and give it for the benefit of the staff, which acts as a stimulus to each man, and shows errors both in physical diagnosis and mental diagnosis. The impor-

tance of good diagnosis, as Dr. Southard pointed out, cannot be questioned from the therapeutic standpoint. A case of general paralysis or dementia may not be benefited much therapeutically, but it may be differentiated from another class of cases which could be treated successfully. That is the point. Dr. Southard brings out that therapeutics could be improved by having a more correct diagnosis. The organic types of mental disease are pretty well established. The anatomical findings and pathologically negative functional cases can be established, so that manic depressive insanity or dementia præcox can be determined at autopsy by the absence of any organic changes. In that way the autopsies serve an important function, they determine not only the organic cases, but in a negative way they determine the functional cases, and although some persons assert that the psycho-pathology of mental diseases has not progressed very much, Dr. Cotton feels that where systematic work is done much can be accomplished.

Dr. Hugh T. Patrick called attention to the fact that under the errors in organic and senile dementia Dr. Southard had placed the senile acute psychoses. The organic and senile dementias as a class must be rather consistently chronic and he should like to inquire why senile acute psychoses were placed here.

Dr. Cotton referred to one feature of the diagnosis which has been employed in the last few years, that is lumbar puncture. He knew nothing more serviceable to clear up diagnosis.

Dr. E. E. Southard, in closing, said that the term *acute psychoses* is perhaps an erroneous one, still it is the one prevalent in text-books for Kraepelin's manic-depressive insanity, for dementia præcox, and for other conditions. "Acute psychoses" is just a cant term. The catalogue of the Surgeon-General's library contains numerous articles on *Insanity (acute)*, which exhibit the prevalence of the usage to which Dr. Patrick objects. An article by Dr. P. C. Knapp, of Boston, on the acute psychoses might be referred to.¹ In any case, by using the term *acute psychoses of senility*, Dr. Southard had not intended any novelty in classification.

Dr. S. D. W. Ludlum and Dr. E. Corson-White, of Philadelphia, presented a paper entitled "Study of the Blood in Nervous Diseases." (*To be published in this Journal.*)

DISCUSSION

Dr Alfred Reginald Allen, of Philadelphia, said that he had listened with great interest to Dr. Ludlum and Dr. Corson-White's paper. He had known in a general way what they had been doing at the University and the great importance of their work. He would like to ask whether they had examined any cases of postero-lateral sclerosis which did not give a syphilitic history, and whether they had drawn any conclusions from them.

Dr. Hugh T. Patrick, of Chicago, asked Dr. Ludlum to explain what he meant by system diseases. He had spoken of combined sclerosis which was thought at the time might be due to syphilis.

Dr. S. D. W. Ludlum, in closing, said by system disease he meant Freidreich's ataxia, in other words two or more columns involved. Two cases of postero-lateral sclerosis were studied and in both a history of syphilis was obtained.

Dr. Edward B. Angell, of Rochester, N. Y., read a paper entitled, "The Clinical Significance of the Urine in 'Nervousness.'"

¹ P. C. Knapp, The Unity of the Acute Psychoses, Boston Med. Surg. Journ., 142, 181, 1900.

Adaptation of Heller's nitric acid contact method to the determination of disturbances of metabolism associated with nervous troubles.

The marked "pigment ring," a counterpart to the white albumin ring of Heller. An easy method of determining the reaction.

The nature of the reaction, due neither to indicanuria nor to biliary pigmentation, although associated at times with both.

The class of nervous cases in which this test is of value.

Illustrated by water color drawings.

DISCUSSION

Dr. Edward D. Fisher, of New York, said he had had an opportunity of talking on this matter with the author of the paper just read. It struck him that he had given us here rather an easy clinical method of diagnosis, and he thought that was one of the objects of his presentation of this paper. If we can find the ring, as he evidently has found it so frequently, a thing that can be done very readily in our offices, it will aid us at least in one feature of our cases which may be organic or may not be organic. That is organic cases may also have functional symptoms, and we get the same lines in the urinary analysis. He would like to endorse very emphatically the point that Dr. Angell brought out that there is very frequently a physical cause for many of the mental symptoms, and while in the discussion we have referred to the value of psychotherapy we must be careful, and this paper of Dr. Angell's endorses this idea, not to forget the physical basis that underlies this condition.

His treatment, as he has outlined it, is one Dr. Fisher has long carried out in cases of neurasthenia, but we often do that in a wavering way. Now that we have a positive diagnosis of the metabolic changes which are going on in the cases we will be encouraged to be more systematic in our medical treatment of these cases.

Dr. D. I. Wolfstein, of Cincinnati, asked what relation this color ring bore to end products of albuminous decomposition such as kreatinin and other extractive substances.

Dr. Wolfstein has always believed that this coloring in the absence of certain drug reactions was supposedly due to such substances.

Dr. Angell, in closing, said he had been unable to make any extended experiments to show the chemical nature of this reaction. We are apt to forget that all but 20 per cent. of the nitrogen waste of the body has to pass out through the kidneys. We all know that we are a proteid-eating race. It is the excessive meat eating which is largely the cause of nervousness, aside from genetic influences.

In replying to Dr. Wolfstein he spoke of this as a reaction which was constantly found. He has no doubt that frequently this may be due to intestinal putrefaction, but in that case we are likely to get indican also. We get many cases with distended abdomens from intestinal fermentation—cases where intestinal fermentation is associated with inefficient elimination of nitrogen waste. They are a direct cause of nervousness, including many of those conditions spoken of this morning. These cases may be cleared up by psycho-analysis, but are more quickly cleared up in the way Dr. Angell mentioned.

Dr. F. W. Langdon read a paper entitled "Radiculitis." (*See this Journal*, p. 488.)

DISCUSSION

Dr. H. T. Patrick, of Chicago, asked the treatment.

Dr. Langdon replied that mercury by inunction was pushed to the limit. Iron albuminate was also given. The patient made satisfactory and steady progress to recovery.

Dr. Patrick asked the condition of the pupils.

Dr. Langdon replied that there was only sluggishness of one pupil as compared to the other. They were not equal. There was a slight difference in the quickness with which they responded. There was nothing to indicate positively an organic change in the cilio-spinal reflex fibers.

Dr. Theodore Diller and Dr. F. Proescher, of Pittsburg, read a paper entitled "A Case of Tetany, with Autopsy Findings."

Clinically the case appeared as one of tetany and terminated fatally by exhaustion. An autopsy revealed hemorrhages into the substance of the parathyroid glands. Some review of the literature.

Dr. Edward D. Fisher, of New York, read a paper entitled "Further Observations in the Ocular Changes in General Paresis and Tabes Dorsalis."

- (a) Rarity of optic atrophy in the cerebral type of general paresis.
- (b) Retention of light reflex in the above cases.

DISCUSSION

Dr. D. I. Wolfstein, of Cincinnati, said he had one case under observation for a long time which also corresponded to the Dejerine type where there was an optic atrophy for a number of years and loss of reflexes and no bladder disturbance, no pain. That case finally terminated with dementia. Following the optic atrophy the man went into the terminal stage of dementia and had delusions of grandeur.

Dr. Alfred Gordon, of Philadelphia, read a paper entitled "Lenticular Zone and Anarthria."

After a historical review of the old view and of the more recent opinion of Marie on aphasia Dr. Gordon reported an anatomo-clinical case in which there was a complete destruction of the left lenticular zone. During life the patient did not present the least indication of dysarthria. The speech was clear and distinct. He did, however, present a partial word-blindness and partial verbal amnesia. The latter condition corresponded in reality to Marie's contention, but was at variance with the old conception concerning Wernicke's zone, as this zone was intact macroscopically and microscopically.

Dr. Gordon discussed at length the various features of his case and endeavored to determine from his findings to what extent Marie's views are justified or not. He reached the conclusion that while the so-called lenticular zone of Marie may play a certain role in sensory aphasia, its role is not considerable. As to its being a center for anarthria, the present case proves that its destruction does not interfere with phonation and articulation of spoken words. Consequently if Marie's conception of aphasia may be applicable to a certain series of cases, as he has shown, it does not hold its ground in every case, in which the sensory or motor speech may become involved.

Finally Dr. Gordon called attention to an almost identical case reported January 29, 1910, by Van Gehuchten, in which there was also a vast focus of softening in the lenticular zone of the left hemisphere, but the patient presented, during life, not a trace of anarthria.

(To be continued)

Periscope

Neurologisches Centralblatt

(Vol. 28. No. 1)

1. The Anatomy of the Posterior Columns (Decussating Fibers). VAN VALKENBURG.
2. Tabes Dorsalis and Acute Bulbar Palsy. K. HALBEY.
3. Hematemesis in the Gastric Crises of Tabes. J. KOLLARITS.
4. Gastric Crises of Tabes as the Result of Morphine. P. A. OSTANKOW.
5. Uterine Crises in Tabes. F. CONZEN.
6. Osteoarthropathia Vertebralis. H. HAENEL.

1. *Posterior Columns*.—The author reports the anatomical study of several human spinal cords with respect to the presence of decussating fibers in the posterior columns and finds such fibers present, though few in number, in all segments of the cord. Their absence when the posterior roots were degenerated would imply that they were direct continuations of fibers of these roots.

2. *Tabes and Bulbar Palsy*.—A case of tabes is reported which was complicated rather late by an apoplectic bulbar palsy and subsequent epileptiform attacks.

3. *Hematemesis in Tabes*.—Persistent hematemesis was observed in a case of tabes for a period of three months previous to death, gastric ulcer or carcinoma being suspected. At the necropsy no lesion was found to account for the bleeding.

4. *Gastric Crises of Tabes*.—In this article the following conclusions are drawn: (1) Morphine and other derivatives of opium long continued may cause true crises in tabes; and (2) morphine and antineuralgics, although they relieve the pains for a time, favor their later return with increased severity. A case is reported which supports these conclusions.

5. *Uterine Crises in Tabes*.—A woman of 33 with tabes dorsalis complained of attacks of pain in the abdomen lasting for two or three minutes and simulating those of labor. A gynecological examination revealed no adequate cause for the pain, and they were interpreted as uterine crises.

6. *Vertebral Osteoarthropathy* in tabes is rather rare. Frank in 1904 found 26 cases described in the literature. The case here reported was studied by X-rays, and was treated by a supporting jacket with some benefit.

(Vol. 28. No. 2)

1. The Element of Reality in Hallucinations. A. PICK.
2. Pseudosystem Disease of the Spinal Cord After Stovain Anesthesia. SPIELMEYER.

1. *Hallucination*.—In a short article Pick discusses the question as to what part actual sensations play in the production of hallucinations.

2. *Stovain Anesthesia*.—Spielmeyer has examined the spinal cords of 16 human subjects and of 10 dogs and monkeys after subdural injections

of stovain. In the human cords the only pathological conditions found were in the cells of the anterior horns, which had the character of reaction at distance. In the cords of the animals degenerations were demonstrated by the Marchi stain principally in the posterior roots and posterior columns, and to a less extent in the anterior roots and periphery of the cord. In the motor cells changes were found similar to those found in the human cords. These changes would appear to be the result of the stovain acting directly on the fibers with which it comes in contact, and the cell changes the result of reaction at distance.

(Vol. 28. No. 3)

1. Sensory Disturbances of Spinal Type Caused by a Cerebral Lesion.

GOLDSTEIN.

2. Tumor of the Corpus Callosum. G. CATOLA.

3. A Case of Ependymal Glioma of the Fourth Ventricle. M. VÖLSCH.

1. *Cerebral Lesion Disturbances*.—A man of 34 years with a history of syphilitic infection 7 years previously, developed hemiplegia after an apoplectic attack. There was also a permanent hypesthesia over the entire half of the body, which, however, varied much in degree in different parts, and was most marked in the distribution of certain segments of the spinal cord, viz., C₄ to D₄, and the lower lumbar and sacral segments.

2. *Tumor of the Corpus Callosum*.—The case described was one of infiltrating glioma of the corpus callosum, extending into the hemispheres of both sides. The symptoms began with a sudden right hemiplegia, after which developed impairment of the intelligence and later involvement of the left side of the body and forced weeping. Cranial nerves were not affected, with the exception of weakness in the right lower face. Apraxic symptoms were not obtainable on account of the psychic condition and the spastic paresis.

3. *Glioma of Fourth Ventricle*.—A man of 37 years suffered from an attack of vertigo after which diplopia was present and lasted for two or three weeks. Two years later he developed all of the general symptoms of brain tumor with bilateral abducens palsy, nystagmus and a marked cerebellar ataxia with a tendency to fall backward. Tumor of the vermis was diagnosed and operation was performed which resulted fatally. At the necropsy a tumor was found practically filling up the fourth ventricle, and pressing upon the vermis and peduncles of the cerebellum.

(Vol. 28. No. 4)

1. Cortex Measurements. A reply to Dr. Brodmann. T. KAES.

2. The Segmental Supply of the Rectus Abdominis. E. SCHWARZ.

3. Myxedematous Skin Changes as a Parallel Process in Manic-Depressive Insanity. TOMASCHNY.

1. *Cortex Measurements*.—Kaes answers the criticism by Brodmann of his paper on this subject by stating that the different hardening fluids used account for the discrepancies in the results obtained by the two investigators.

2. *Rectus Abdominis*.—Following a stab wound in the back, a man exhibited a partial Brown-Séquard paralysis. The left foot was weak and ankle clonus present; on the right leg was an area of dissociation of sensation, and on the left side of the abdomen a band of anesthesia in the distribution of the twelfth dorsal and first lumbar roots. The abdominal

reflex was present and normal on the right side, present but diminished on the left side above and lost below the navel. The lower half of the left rectus abdominis was flaccid and gave typical reaction of degeneration. The transverse and oblique abdominal muscles were normal.

3. *Skin Changes in Manic-Depression*.—The patient, a young woman, was under observation during two complete cycles of mania and depression lasting over a period of about two years. During both periods of depression there were marked changes resembling myxedema, most noticeable in the face, and especially about the mouth, which did not yield to thyroid extract. The author considers this case as a proof of the close relationship between insanity and disturbances in metabolism.

(Vol. 28. No. 5)

1. The First Castrations for Social Reasons in Europe. P. NÄCKE.
2. The Boundary of the Spinal Root Zones of the Upper Extremity. CALLIGARIS.
3. Questions in Psychiatry from the Literature and History of the Jews. MAX SICHEL.

1. *Castration*.—Näcke refers to the report of the Kanton Asylum at Wil for the year 1907 in which are given accounts of four cases, two males and two females, who were castrated for social reasons. He discusses this procedure at length and favors its adoption in suitable cases.

2. *Spinal Root Zones*.—In this article the author discusses the boundaries between the sensory areas supplied by the posterior roots of the cervical and brachial plexuses, and attempts to explain the peculiarities which exist by applying his theory of sensory distribution, *i. e.*, the existence of a great number of hyperesthetic lines which so intersect each other as to form a complete network. Longitudinal lines extend to the arms forming the so-called radicular fields, and horizontal lines supply the segmental or metamerie fields.

3. *Psychiatry from Jewish Literature*.—(Continued article.)

(Vol. 28. No. 6)

1. The Progress of Recovery After Operative Treatment of Tumors of the Spinal Membranes. H. OPPENHEIM.
2. A Peculiar Painful Sensation Associated with an Enlarged Prostate. BERNHARDT.
3. Questions in Psychiatry from the Literature and History of the Jews. SICHEL.

1. *Recovery After Operative Treatment of Spinal Membrane Tumors*.—This paper is based entirely upon the cases seen by Oppenheim, and is, as he states, largely a résumé of previously published work, the cases being those which were operated upon, and their post-operative history only is considered. Much practical and valuable information is given.

2. *Painful Sensations*.—A man of 60 years, who but for a hypertrophied prostate appeared well, suffered at times (not every day) a peculiar sensation of pain in both hands and forearms in the distribution of the musculocutaneous, superficial radial and median nerves after emptying the bladder. This pain did not accompany the straining, but appeared only when the bladder was relieved of pressure, and lasted from 5 to 10 seconds. The author is at a loss to explain the symptom, and has not been able to find an account of a similar case.

3. *Psychiatry from Jewish Literature*.—Not suitable for abstract.

(Vol. 28. No. 7)

1. Symmetrical Apoplexy in the Region of the Cornu Ammonis in Epilepsy. HERMANN.
2. Korsakow's Polyneuritic Psychosis. W. CHOROSCHKO.
3. The Technic of a Myelin Sheath Stain. P. MEYER.
4. A Short Consideration of Näcke's article, "The First Castrations for Social Reasons in Europe." O. JULIUSBURGER.

1. *Apoplexy in Epilepsy*.—Attention is called to the pathological changes which have been found in the cornu ammonis in epileptics, including cellular, neuroglial and vascular changes. The case here reported was that of a man of 37 years who developed epilepsy at the age of 23, and who was also demented. Post-mortem examination revealed a large hemorrhage on the left side, breaking into the posterior horn of the lateral ventricle; and on the right numerous small hemorrhages in and about the cornu ammonis. No mention is made of any microscopical examination.

2. *Korsakow's Psychosis*.—In recent times the question of focal symptoms referable to the brain in polyneuritic psychosis has been considered, and the author refers particularly to the work of the German writers, Knapp and Kutner. The case here reported was one of typical alcoholic multiple neuritis with Korsakoff's syndrome in a woman of 40 years whose history, with the exception of alcoholism, was negative. She was under observation for about eighteen months, during which time all of the symptoms gradually cleared up. The point of particular interest in this case was a constant nodding movement of the head which appeared with the mental symptoms, persisting throughout the whole course of the affection, and gradually disappearing with the general improvement. The author considered this as a focal symptom, the localization of which he was uncertain about, but was inclined to favor the cerebellum.

3. *Weigert's Stain*.—After testing the various modifications of Weigert's myelin sheath stain the author describes the one which he has found to be most useful, particularly for large brain sections. Specimens are fixed in formalin and cut into blocks and hardened in 5 per cent. potassium bichromate solution for at least two weeks. They are then washed in frequent changes of 70 per cent. alcohol and embedded in celloidin. Sections are mordanted for twenty-four hours at 37° C. in a solution of copper acetate 50 parts, acetic acid 50 parts, chromium fluorid 25 parts and aq. dest. ad 1,000 parts. Rinse in 70 per cent. alcohol and stain for twenty-four hours in equal parts of (A) hematoxylin 1 and alcohol 99, and (B) Liquor ferri sesquichlorat. Pharm. Germ. 4 per cent. solution. A and B must be mixed thoroughly and just before using. The sections are differentiated in the usual borax, potassium ferricyanide solution, used very weak at first and then washed for twenty-four hours in water to which a few drops of lithium carbonate solution have been added. Mount in the usual way.

4. Not suitable for abstract.

(Vol. 28. No. 8)

1. The Investigation of the Cerebrospinal Fluid. E. MEYER.
2. The Vagus Nucleus in Dogs. K. KOSAKA.
3. Nodular Necrosis in the Cerebral Cortex. G. OPPENHEIM.
4. A Newly-perfected Clonograph and Its Mode of Application. E. LEVI.

1. *Cerebrospinal Fluid*.—The author summarizes the results obtained in examinations of the cerebrospinal fluid of 100 cases from his clinic with special reference to the globulin tests, and in the last 40 using Nonne's method, which consists of adding to the cerebrospinal fluid an equal quantity of a neutral, hot, saturated solution of ammonium sulphate. Turbidity appearing within three minutes is designated as Phase I, and that appearing after three minutes, which should occur normally, as Phase II. Functional cases and all cases of syphilis not involving the nervous system gave negative results. Positive results were obtained in all cases of syphilis of the nervous system, tabes and paresis, and also in some other organic diseases, such as brain tumor, multiple sclerosis, etc.

2. *Vagus Nucleus in Dogs*.—In this article is given a brief account of the author's experiments on dogs, some of which were previously published. The dorsal nucleus is considered to belong exclusively to the vagus, because: (1) the inner branch of the accessory nerve and the bulbar root of the accessory are really a part of the vagus; (2) the glossopharyngeal has nothing to do with the dorsal nucleus. The connections of this nucleus are with the glands and unstriped muscles of the esophagus and stomach, apparently indirectly through the sympathetics. No motor fibers are supplied to the lungs, but it is probable that the unstriped muscles of the trachea, bronchi and bronchioles are supplied through the sympathetics. The nucleus ambiguus consists of three main divisions, upper, middle and lower, which supply the striped muscles of the soft palate, larynx, pharynx and esophagus. A subdivision of the lower division acting as the cardio-inhibitive center.

3. *Nodular Necrosis*.—In the examination of fourteen senile brains, the author found in six the presence of nodular necrosis, described in 1907 by Oskar Fisher as found in senile dementia. These changes were found in different degrees of dementia and in senile brains without dementia in about the same proportion by Oppenheim, whereas Fischer regarded them as pathognomonic of senile dementia. The nodules consisted of limited areas of dead tissue surrounded by club-like proliferations of neuroglia.

4. *The Clonograph*.—The clonograph described consists of an apparatus for making graphic records of ankle clonus, and consists of a plate attached to the ball of the foot, connected by a chain and tubular cylinders forming an air cushion to another plate attached to the knee. By adjusting the chain at a suitable tension, the movements of a true or a false clonus can be recorded on a revolving drum through the variations in pressure of the air cushion.

(Vol. 28, No. 9)

1. The Status of the Aphasia Problem. H. LIEPMANN.

1. Not suitable for abstract. Must be read in original.

(Vol. 28. No. 10)

1. A Contribution to the Question of Hereditary, Family, Spastic, Spinal Paralysis. G. VOSS.

2. Concerning the Portion of the Soft Palate in Cerebral Hemiplegia. R. TETZTER.

3. Concerning Secondary Degenerations After Lesions of the Central Nervous System at the Point of Union of The Spinal Cord and Medulla. KALINOWSKY.

1. *Spinal Paralysis*.—Voss records five cases of spastic spinal paralysis occurring in four generations of one family, three of which he personally observed, and the other two of which he obtained fairly accurate histories. In the first generation affected the disease appeared when the patient was about 50 years of age. In succeeding generations it appeared earlier in life, and in the last, a young woman of 20 showed signs of the affection.

2. *Soft Palate in Cerebral Hemiplegia*.—Detailed description is given of experiments on two rabbits and two guinea pigs in which the lower end of the medulla or the upper part of the cervical cord was unilaterally punctured. The animals were killed after two or three weeks, and the central nervous systems examined by the Marchi method for secondary degenerations. Nothing new of importance is brought out.

INGHAM (Philadelphia).

Brain

(Vol. 32. Part 127, 1909)

1. On the Cervical Spino-bulbar and Spino-cerebellar Tracts and on the Question of Topographical Representation in the Cerebellum. A. S. MACNALTY and VICTOR HORSLEY.
2. The Conditions of Fatigue in the Nervous System. W. McDUGALL.
3. The Pathological Examination of Two Cases of Amyotonia Congenita with the Clinical Description of a Fresh Case. JAMES COLLIER and GORDON HOLMES.
4. An Epidemic of Acute Poliomyelitis. W. W. TREVES.

1. *Spino-bulbar and Spino-cerebellar Tracts*.—The object of these authors' investigation was to establish, if possible, what tracts ascend from the cervical region of the spinal cord to the bulb and to the cerebellum, for it is curious that hiatuses yet exist in our precise knowledge of the tracts which pass from the spinal cord to the cerebellum, one of the most notable being the absence of investigation into the relation of the spinal innervation of the fore-limb to the cerebellum. As regards the spinal cord itself, practically the only attempt to compare the proportional representation of the fore- and hind-limb respectively in the spino-cerebellar paths is contained in a paper by Collier and Buzzard. In the present work the examination of the material has afforded an opportunity of considering how far anatomical research supports the views on the localization of function in the cerebellum which have been especially advanced by van Rijnberk on the anatomical ideas of Bolk.

As regards the first of these questions, while the source of the direct tractus spino-cerebellaris dorsalis is fairly well recognized and its destination partly ascertained, the origin of the tractus spino-cerebellaris ventralis, Gowers' tract, is almost as unknown to-day as when Edinger said of it in 1904 "der Ursprungsort ist noch nicht bekannt."

Its terminal distribution also to the vermis cerebelli, first ascertained by Mott, has since been variously described and requires fresh determination. Further, the origin and destination of the marginal fibres between these two great tracts and those which compose the dorso-ventral tract of Pellizzi have received little attention, except from that author.

The authors after posing the questions take up the available literature, first on Gowers' tract (tractus spino-cerebellaris ventralis), and that on Fleschsig's tract (tractus spino-cerebellaris dorsalis). Operations on monkeys are then detailed, and the degenerations figured. Some of the

results obtained were as follows: The spino-cerebellar fibers springing from the upper cervical region (head and neck movements) pass to all portions of the vermis except the most dorsal and most ventral, the parts omitted being the two anterior lobuli of the lobus posterior (Elliott Smith) and the lingula, nodulus and uvula. Further, these fibers, like those from lower spinal levels, give off in the medulla collaterals to the nucleus vestibularis (Deiters'), the nucleus formationis reticularis, and the nucleus lateralis.

The spino-cerebellar tracts for the upper limbs show:

(1) *Ipsilateral fibers*.—(a) Dorsal fibers: A few fibers pass through the tractus spino-cerebellaris dorsalis forming the most internal group and occupying longitudinally a length of three segments in attaining their position in the area of the tract. (b) Dorso-ventral: Fibers of varying diameter from the intermedio-lateral region of the cornu pass up in the lateral column at a distance from the peripheral margin of the cord to the nucleus reticularis medullæ and to the nucleus lateralis medullæ. (c) Ventral Fibers: The ventrally running fibers tend to form Gowers' tract in the usual way, but they remain in the ground-bundle area of the lateral column and do not reach the surface of the cord. The most internal pass in the medulla close to the outer margin of the spinal fifth and ascend to the cerebellum lying between the fibers of Gowers' (dorso-lumbar) tract and the fastigio-brachial bundle (fasciculus fastigo-bulbaris).

(2) *Contra-lateral Fibers*.—These are of varying diameter, and on the average smaller than those of the ipsilateral side. They run up in the ground-bundle, gradually passing outwards, and only arriving at their place in the main path after passing through about five segments of the cord. In the formatio reticularis they lie ventrally and internally to the trigeminal spinal root. These fibers are internal to, and do not appear to send collaterals into the nucleus lateralis of the medulla. As they ascend in the formatio reticularis they gradually diminish in number.

As to the terminal distribution in the cerebellum the authors find:

Region I: The spino-cerebellar fibers of this region, which are in the main furnished through the tractus spino-cerebellaris ventralis, are distributed to the lobus centralis and culmen. None pass to the lingula. A few are distributed to the uppermost folia of the lobus pyramidalis (i. e., through the tractus spino-cerebellaris dorsalis).

Region II: The fibers of this region, i. e., arising from the fifth cervical to the first dorsal spinal segments, end in the cortex of the cerebellum as follows; the lobus centralis, the ventral half of the culmen, and the ventral half of the lobus pyramidalis.

In full agreement with Mott's results they have found that the fibers of Gowers' tract (purely isolated) are practically not distributed to any part of the cerebellar cortex behind the plane of the anterior cerebellar commissure, except the collaterals which are distributed to the nucleus fastigii of the same side. Further that the distribution to the cortex is by medium-sized collaterals springing from the main fibers as they cross in the anterior commissure. These collaterals enter all the folia of the lobus centralis and ventral part of the culmen. A striking illustration of the fact that the fibers of the tractus ventralis from the hind-limb region, Region IV, of the spinal cord are distributed to exactly the same area of the cerebellar cortex as those from the fore-limb region is shown by two experiments (62 and 80, 1903, V. H.), in which extremely limited lesions of Gowers' tract were made at the first lumbar level and the third and

fourth cervical level respectively. In both animals the degenerated fibers were precisely traced to the same point in the cerebellum, viz., the lobus centralis and to the ipsilateral nucleus fastigii, no fibre passing to the cortex cerebelli anywhere caudal to the posterior plane of the commissura anterior.

Region IV: The termination of the spino-cerebellar fibers in the cerebellum from the caudal limb region may be limited to the discussion of the tractus spino-cerebellaris dorsalis.

According to their observations the whole tractus spino-cerebellaris dorsalis ends by freely branching fibers in the lobus centralis, the culmen, the lobus posterior, and the lobus pyramidalis on both sides of the median plane, the ipsilateral fibers being to the contralateral as 2 to 1.

Mott's original description is in general principle thus fully established, and it is clear that whereas the tractus ventralis is distributed principally to the folia of the lobus centralis and to a much less extent the culmen and lips of the primary fissures, the tractus dorsalis not only supplies the same cerebellar cortex, but extends backwards throughout the lobus pyramidalis. Thus, the area of distribution of the tractus ventralis is anterior or headward compared to that of the tractus dorsalis.

The connection between the spinal nuclei and the cerebellar nuclei they find:

(1) *Via the Tractus Spino-Cerebellaris Ventralis:* "We have already discussed the supply of the tractus spino-cerebellaris ventralis to the cortex of the cerebellum. We must now discuss the precise nature of the important connection between this tract and the nucleus fastigii (roof nucleus), a connection the existence of which has been questioned. This association, which was described in man by Collier and Buzzard, is provided by numerous fibers in the rhesus and in the carnivora (cat, dog).

As the fibers of the tract cross in the anterior commissure, they send stout collaterals back between the nuclei fastigii, within which finer branches of these fibers ramify throughout the whole nucleus. The spino-nuclear connection is almost wholly unilateral, few fibers entering the contralateral nucleus.

(2) *Via the Tractus Spino-cerebellaris:* The dorsal spino-cerebellar tract has, so far as we can see, no connection in the cat or rhesus with the nucleus dentatus, although the fibers curve round the nucleus to reach the cortex and although such communication was observed in man by Collier and Buzzard. Absence of such connection would be, of course, in harmony with the fact that the nucleus dentatus is in connection with the cortex of the lateral lobe and therefore not, like the vermis and nucleus fastigii, in direct association with any spinal path (for the cortical relations of the nuclei, see Clark and Horsley, *Brain*, 1905, p. 13), but the proximity of the tracts to the fleece of the nucleus suggests an intercommunication and the point is worthy of a special reinvestigation.

The distinction between the vermis and the lateral lobes generally recognized is thus intensified.

IV. On the Question of the Topographical Localization of the Limbs and Part of the Body in the Cerebellum: From the foregoing account of the distribution of the cervico-cerebellar fibers, especially those of the ventral tract, it is quite clear that by their distribution over the whole area of the vermis, which is allotted to the spino-cerebellar system, each part of the spinal cord must, practically speaking, be represented in every unit of the cortex to which the spinal fibers run. From the point of view

of afferent function, therefore, there cannot be said to exist any evidence of differentiation of the cerebellar cortex into localized receiving stations for the impressions (muscular, arthritic, etc.), which ascend from the arm, trunk, or leg muscles, joints, etc., respectively.

It would appear, therefore, that the cerebellar cortex is a structure in which these muscular-sense impressions are associated together, or, to use a more frequently employed expression coördinated. The recent excitation and exclusion experiments by which it is believed that definite centers for the movements of different parts of the body have been demonstrated to exist in the cortex cerebelli, just as in the cortex cerebri, must, we think, be otherwise interpreted. Particularly is this the case, where exclusion experiments have been made by extirpation of parts of the cerebellar cortex, for there is no doubt that the error pointed out originally by Clarke and Horsley has not been sufficiently avoided, and that the phenomena noted have been due at least as much to lesions of the subjacent nuclei, the nucleus fastigii, dentatus, etc., and even of the nucleus vestibularis, as of the cortex cerebelli.

V. Symptoms Displayed by the Animals in whom Lesions of the Cervical Spino-Cerebellar Tracts had been made: Our clinical observations on the experimented upon animals, though furnishing only few symptoms and those remarkably limited in degree owing to the very restricted character of the lesions, are nevertheless, confirmatory of the results obtained by Marburg and Bing.

The first notable point is the question how far interference with the spino-cerebellar tracts causes a loss of efferent (purposive) movement. No such loss was observed by us. The motor effects we observed were invariably transitory and attributable to the direct interference with the anterior cornu, or to the effects of the anesthetic. As regards equilibration, however, and accuracy of movement in all the animals experimented upon there was to be seen ataxy and clumsiness of movement most noticeable in the upper limb. With the ataxy there was very frequently contracture and the arm of the same side was often in the sling position as described by Mott and Sherrington, after division of the (brachial posterior) roots.

2. *Fatigue*.—McDougall distinguishes three classes of fatigue. (1) Local sensations, more especially in the muscles. (2) A feeling of general limpness, of general incapacity for effort. (3) Sleepiness. The first he considers purely protective in function. It is a forerunner of exhaustion. With reference to the two other classes, he views them always in the light of relative, rather than absolute, symptoms. They are always the expression of the relation between at least two things, on the one hand the work to be done, and on the other the amount of energy available for doing the work. This proposition he sets out as follows: Where the fatigue of the nervous system is a state in which the ratio of the resistance of the active energies is raised above its normal value, either through increase of the magnitude of the resistance, or through diminution of the quantity of disposable energy. (2) The function of the resistances is essentially the limitation of activity: they are thus protective of the energy of the organism; they prevent the organism from exhausting the store of energy through unduly prolonging intense or widespread activity.

McDougall criticizes Verworn's scheme as being too simple. He is inclined to regard both neurasthenia and hysteria as forms of chronic fatigue.

3. *Amyotonia Congenita*.—The authors contribute a clinical and pathological study of two cases of this disorder. The chief clinical features which should be placed in the foreground are as follows: (1) The absence of any familial tendency in the incidence of the disease. (2) The absence of any familial or etiological relation with myopathy. (3) Amyotonia is in the majority of cases congenital. In a small majority of cases it appears suddenly and in fully developed form after certain acute diseases. (4) The local wasting and weakness of an individual muscle, or of a group of muscles, that are characteristic of all forms of myopathy are not met with in amyotonia. (5) Affection of the periphery of the limbs, and especially of the intrinsic hand muscles, which is the invariable rule in amyotonia, is of the greatest rarity in any form of myopathy. (6) Amyotonia never spreads to regions previously unaffected. Slow spreading of the affection from muscle to muscle is a characteristic of all forms of myopathy. (7) The deep reflexes are absent from the first in amyotonia. In myopathy they are present at first, and they slowly diminish and are lost as the affection of the muscles concerned increases. (8) The deep reflexes may appear in amyotonia when improvement occurs, and, having appeared, remain permanently. In myopathy the deep reflexes never reappear after disappearance. (9) A majority of the recorded cases of amyotonia have shown a tendency to improve progressively, and this progression may reach a stage of practical recovery. Pathological changes were found throughout in the muscles, consisting for the most part in a smallness of the majority of the muscle fibers, which may be attributed on the one hand to a lack of development, or on the other to regressive or atrophic processes affecting them. The authors incline to this latter view, because of the extraordinary irregularity in the shape and size of the fibers. The great atrophy, and decrease in the number of the muscle fibers sufficiently explain the palsy, while the infiltration of the muscles by fat, and the increase of active tissue cells, concealed in part the general atrophy. The contractures that occasionally develop are probably due to sclerosis of the fibrous tissue laid down in the muscles.

As to the relation of the morbid anatomy of this case to the myopathies in general, they admit that there is no essential difference, though in one of their cases there was not as great an increase in the number of nuclei in the atrophied fibers as is generally present in the myopathies. Myopathic muscles are characterized by the presence of atrophied and hypertrophied fibers, with a proliferation of their sarcoplasmic nuclei, and various regressive changes in them, an increase of connective tissue and a deposition of fat. They also observed a thickening of the vessel walls which is almost constant in myopathic muscles, and the collections of small round cells which they found are quite similar to those which may be seen in myopathic muscles. The changes found in the thymus by Spiller who made the first pathological investigations, and in the thyroid and thymus by Baudouin were not present in the authors' cases and they are inclined to regard the changes in these glands as thyroidous, and as not playing any part in the essential pathology of the disease. From the standpoint of pathology, the authors admit the possibility of improvement, but the likelihood is towards the occurrence of progressive deterioration in some, if not most, of the cases. The differentiation between this disorder and the myopathies seems to rest more on clinical than on pathological grounds.

4. *Epidemic of Poliomyelitis*.—The author after giving a short summary of some of the more widespread epidemics reports the occurrence of

one in the village of Upminster in the summer of 1908. Only eight cases were involved, complete histories of which are given in this short paper.

JELLIFFE.

THE ŒDIPUS-COMPLEX AS AN EXPLANATION OF HAMLET'S MYSTERY: A Study in Motive. By Ernest Jones, M.D. *Am. Jour. Psychol.*, Jan., 1910.

The Hamlet mystery has been a mystery for many generations, but each attempt at its solution has seemed rather to increase than to lessen the difficulty. Dr. Jones' effort would have come in only for passing mention had he followed the well-beaten paths, but his application of the Freudian principles of psychoanalysis to its solution not only has produced something quite new, but has opened up the way for the application of a new principle in art critique.

The specific problem of the Hamlet tragedy is Hamlet's inexplicable inactivity in the face of his own perfectly clear recognition of his duty and resolution to avenge his father's murder. This incapacity for action—*aboulia*—is perfectly recognized by Hamlet himself who frequently refers to it, as for example:

"I do not know

Why yet I live to say 'This thing's to do'

Sith I have cause, and will, and strength, and means,
To do't."

The explanation Dr. Jones reaches for this state of *aboulia* is that it is due to a mental conflict the result of a suppressed complex and runs, briefly, as follows: Hamlet was in love with his mother and that love, engendered while a child, as Freud has explained it may be, contained an erotic element. This feeling, naturally abhorrent and hateful to him he suppresses: it is the typical mother-son complex or as it is frequently called because of the clear way in which it is set forth in Sophocles' tragedy, the *Œdipus* complex. This suppressed complex makes him jealous of his uncle in her possession as he had been jealous of his father before. Now every effort he makes to carry out his revenge stirs into activity his suppressed complex. He cannot kill Claudius without acknowledging *to himself* the desire which goes with his desire for revenge, namely, the desire to possess his mother. Therefore every effort to act only brings on the necessity for greater effort to suppress this hateful feeling and as a result no action issues. No such conflict occurs in his relations to the queen and we find him taking her to task most roundly for her incest while his other acts, such as the killing of Polonius, and his quick, decisive resolution to follow the ghost, show no vacillating disposition. Hamlet's failure to act then is due to a mental conflict centered about a suppressed complex.

To inquire into the mental state of a literary creation solely is a bootless procedure. To inquire into the sanity or insanity of a purely fictitious character can have no meaning. Such a character must derive all its meaning from and find its explanation in its creator—in this case Shakespeare. Jones believes Shakespeare depicted much of himself in Hamlet and brings forth the important evidence that just antedating the writing of the play Shakespeare's father had died—an event well calculated to awaken repressed memories in him in the same way as had the death of Hamlet's father in Hamlet.

It is well known by those familiar with Freud's work that those who act in obedience to a suppressed complex do not know and cannot explain the motives for their conduct. We find plenty of evidence of this state of mind in Hamlet's utterances: for example he speaks of himself as being "unpregnant" of his cause. Now if Hamlet did not know why he could not act it was because Shakespeare himself did not know, while a study of the critics will show that they have never been able to explain it nor yet have the public known the reason.

It is this apparent paradox, a great work of art produced by a man who did not know the motive actuating him, in which the principal character is throughout unable to explain himself, and viewed by an enthusiastic but uncomprehending public generation after generation, that seems to me the most important result of this analysis. To every one who has read much of art criticism there must at times have come the feeling of its inherently unsatisfying nature. The explanations of works of art, the reasons given for their greatness, are after all very superficial and often, if not always, very unsatisfactory. Why are some works of art great? Why have they survived the centuries in the hearts of men? Is it not perhaps because that in their contemplation they have gone beyond the façade of our intellectual and emotional life, they have entered the portals of our personality and have penetrated to a something fundamental—a something common to all mankind? It is in these considerations, the approach to the problems of art from the psychological side and by the methods of psychoanalysis, that I seem to see a new mode of attack, a new principle on the horizon of the art critic. Such a conception seems to me full of possibilities. May we find in the near future many more efforts of this character and may they not be confined to the field of literature! The Sistine Madonna or the Venus de Milo would offer wonderful opportunities.

WHITE.

THE WASSERMANN REACTION IN PSYCHIATRY AND NEUROLOGY. Felix Plaut.
(*Zeitschrift für die gesamte Neurologie und Psychiatrie*, Bd. I,
Hft. 1.)

The author gives a résumé of the work done in this line during the past year. He first reviews the various new modifications in the technique, mentioning those only which come under the complement-forming group. The methods outside of this group have practically fallen into disuse. After discussing the various modifications he comes to the conclusion that it is safest to adhere to the classical Wassermann method. He dwells on the difficulties one meets in attempting to sift through the literature on the subject in a critical manner, chiefly because of the variety of methods used by different investigators. After discussing the specific value of the reaction in the different diseases in which it has been employed, the author comes to the following conclusion:

The positive reaction of the blood to the Wassermann test cannot of itself establish the existence of a metaluetic or luetic affection of the central nervous system. It only shows that the patient suffers from syphilis.

The negative finding of the blood plays a more decided role as a single symptom. It establishes once for all that there cannot be a great suspicion of general paralysis: also, the existence of cerebrospinal lues becomes highly improbable in the absence of positive Wassermann, but

here it behooves one to be careful before a positive statement is made. We cannot positively exclude tabes because of a negative Wassermann finding. It seems, however, that tabetic cases which show a negative Wassermann consist in the majority of instances of the stationary form of tabes. Therefore it is not at all unlikely that we will be able to say in time, that where it concerns a fresh case of tabes, we shall expect to find a positive Wassermann reaction of the blood, and that in the presence of the negative Wassermann it is highly probable that we are not dealing with a tabetic process.

The positive Wassermann reaction of the cerebrospinal fluid is unquestionably of the utmost importance. It establishes once for all that there is a process going on in the central nervous system, which is closely allied to syphilis (a metaluetic process). If the central nervous system is not affected by such a process, then the cerebrospinal fluid is free from the Wassermann reacting substances, no matter how positively the blood may react. The positive reaction of the fluid is almost absolutely confined to the metaluetic cases, while patients with true syphilitic lesions of the brain or cord never, or only in very rare exceptions, show a positive reaction in their fluid. True luetic lesion of the central nervous system cannot therefore be differentiated by means of the Wassermann reaction from cases of general syphilis with an intact central nervous system. The existence of paresis or tabes is almost positively established in the presence of a positive Wassermann reaction in the fluid. A Wassermann negative finding of the cerebrospinal fluid makes the existence of paresis highly improbable, because the percentage of cases of paresis with a negative cerebrospinal fluid is very slight. However, a positive finding of the fluid speaks stronger for than a negative does against paresis.

When in the absence of a Wassermann reaction of the fluid the differential diagnosis between tabes and paresis is in question, one should be inclined more towards tabes.

BERNARD GLUECK (Govt. Hosp. for Insane, Washington, D. C.)

SPINAL CORD TUMORS. Pearce Bailey, New York (Journal A. M. A., March 12).

The author believes that we can take a more hopeful view of the operative treatment for tumors of the spinal cord, and that the time has come to let up on our former conservatism. Instead of questioning whether a tumor is present in every case of paraplegia without known cause, we should ask are we sure such a tumor is not present? He reports three cases of recent operation and also the after-history of three cases in which the patients were operated on and reports of which were published several years ago. As regards diagnosis he remarks that multiple sclerosis may give symptoms similar to those of tumor of the cord, as also may Pott's disease, aneurism, and syringomyelia. Text-books give so little attention to the diagnosis of metastases, probably because they are so unmistakable from the history and the local tenderness they produce. The diagnosis, however, may be difficult, if the lesion is not in the bone or if atypical in not causing tenderness. Metastases of carcinoma, especially of the breast and prostate, are the most frequent and almost always in the vertebræ. The metastases of carcinoma are usually in the form of direct extension from neighboring parts and may involve or skip the bone. Hypernephromas have a predilection for the vertebræ in their extensions. Fibromas cannot be regarded as metastatic tumors, but by their methods

of spreading and dissemination are important in diagnosis. Dercum has called attention to the fact that rapidly growing metastases of goiter may occur in the cord. Examination of the cerebrospinal fluid is not of great practical value in diagnosis. It is generally normal, except in case of acute disseminated sarcomatosis of the central nervous system. The Wassermann test may determine the specific character of the tumor. One of the chief difficulties of the clinical diagnosis of spinal cord tumors is the extreme irregularity of their course. The onset may be sudden but the course not necessarily rapid, and again they may be so rapid as to suggest an acute infectious disease, or they may exist unrecognized for years. History of trauma merits attention as they often arise after injury and may be aggravated by it. The general rules for localization are the same as for spinal diseases generally, but symptoms given by the vertebræ out-value all others for focal diagnosis. In view of the long intraspinal course of the nerve roots, especially in the dorsal area, it is important to determine whether focal symptoms come from the root or from the segment from which it arises. Experience proves the truth of Brun's law that such symptoms generally proceed from the segment, *i. e.*, that spinal cord tumors compress the segments of the cord rather than the roots that run over them. Hyperesthesia may, however, result from pressure on the root itself. Too much reliance should not be placed on referred pains as localizing signs. They are apt to be too general and indefinite. In the lumbosacral region both cord and root symptoms may be caused but tumors limited to the cauda give mainly sacral symptoms. The Brown-Séquard complex does not occur with tumors in this region but does in the lumbar region. According to Oppenheim, a tumor exerts its chief pressure at its upper pole, compressing at the upper limit only, as in a case he reports. As regards the transverse section of the cord occupied, to determine whether the tumor is pressing on the cord or growing in it or is laterally, anteriorly, or otherwise implanted, it is not always possible to say. Rapidity of growth may help to determine, and intramedullary tumors may give rise to dissociation of sensation, but this is not very serviceable in differential diagnosis. As regards indications for operation, Bailey considers them much more positive when the tumor appears to be in the cord itself or membranes, rather than in the bones. The only contraindications then are too great weakness of the patient or evidences of irremediable destruction. While the chances of success are poor, the diagnosis of intramedullary tumor can not be made during life with sufficient certainty to contraindicate the possibilities of good in the operation. Laminectomy for spinal cord tumor is hazardous on account of the poor resistance of the patients. An important point is to operate early enough. It is well to have the probabilities of situation in mind, as given in the table of Schlesinger. Intradural tumors greatly exceed in frequency extradural ones and the larger proportion are ventral or central in situation. The chances therefore of its being hidden by the cord in operation are very slight. The dura should be opened if it shows no external tumor and no obstacle is found to a hook or probe passed down to the ventral surface of the sac. The details of the technic are given. The author thinks more attention should be given to the escape of cerebrospinal fluid and questions whether some sudden operative deaths may not be due to inattention to this point. He advises operation on a table tilted with the head downward or in the Trendelenburg position, to avoid this complication. After-leakage should never occur as it is easily avoided by careful suturing.

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PERSONAL EXPERIENCE WITH FREUD'S PSYCHO-ANALYTIC METHOD¹

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I venture to believe that there are many neurologists in our association whose attitude towards Freud's method of investigation and treatment of a large, serious and relatively neglected group of illnesses, a method to which the name of "psychoanalysis" has been attached, is very much what my own was previous to about a year ago. I had been repelled, long before, by certain of his assertions, and although I had read several of his papers yet I gave no adequate study to the subjects of which he wrote, until a few months previous to last September, during which month Freud and Jung came to America to deliver short courses of lectures at Clark University, in Worcester. Since then I have treated, more or less thoroughly, sometimes quite imperfectly, about twenty patients, suffering from anxiety-neuroses, hysteria, neurasthenia, fears, impulsions. There has also been one case of impotence and one of stammering, both of which have interested me greatly.

These groups of cases have seemed to me of peculiar importance for the purposes of this communication, because of the fact that many of the patients had been treated by me earlier—some of them, off and on, for several years—and I could there-

¹ Read at the thirty-sixth annual meeting of the American Neurological Association, May 2, 3 and 4, 1910.

fore fairly compare the new results with those previously obtained.

In almost every instance the new results have been materially better than the old, and when the histories which were secured after this treatment was begun are compared with those which had been secured previously, either as regards detail or completeness, the difference between them is immense.

I soon became convinced that my earlier acquaintance with these patients' lives, characters, capabilities and needs had been utterly superficial. The morbid conditions which are here at stake are practically psychiatric.

If the psychogenetic element in mental disorders is ever to be made out, it is here that it is to be sought and studied. It is true that under the influence of rest and improvement of the bodily health, a better mental and physical environment, or such measures as occupations of favorable sorts, neurotic symptoms may be temporarily side-tracked. Even in severe cases there are periods of relative relief. But these improvements are either of short duration or else they usually mean that these patients remain mutilated hangers-on of life, contributing little of real value, dependent on artificial conditions of living such as it is difficult to create or to maintain. Sometimes, indeed, a better result is seen. The entrance on a new phase of life in youth, exposure to new and strong influences which appeal to some undeveloped trait or taste, a strong friend, a strong and skilful physician using methods of his own development (careful dissociation and reassociation, hypnoid methods, reëducational methods, etc.) may induce remarkable results in favorable cases. The cures reported by such men as Janet and Prince and Sidis are a warrant for this statement. But large numbers of unfortunate persons go untreated or unrelieved whom a thorough psycho-analysis would place on the high-road to a substantial degree of mental health. And this for an obvious reason, namely, because these illnesses rest upon deep-seated twists of character and temperament which this method is especially adapted to discover and relieve. Every successful method must work through a process of reëducation and the kind of reëducation that deals most fully with the causes of the illness gives the best promise of a broad success. These untreated, unrelieved, unfathomed cases play but little part in the estimates of those physicians who conceive that

our present means of treatment are sufficient. But the keen and able Janet, in the chapters on therapeutics and prognosis of his monograph on "Psychasthenia," admits a gloominess of outlook for these patients, and a relative helplessness of treatment, such as Freud would not accept. The modes of treatment which Janet recommends are admirable and judicious, but at many points gaps are visible which psycho-analysis could fill.

The statement has been made that there seems sometimes to be a somewhat tide-like ebb and flow of the tendency to fears, impulsions and the like, with psycho-neurotic patients, independent of all treatment, and the inference has been drawn that we are dealing with deep-seated degenerative and hereditary tendencies in the face of which no treatment could be permanently of avail.²

But to say this is to beg the question. One of the most hopeful outcomes of this psycho-analytic method is the prospect of its ability to cope with conditions hitherto believed to be beyond relief. There are obvious limits to its usefulness but nevertheless it strikes deeper than any other method now known to psychiatry, and reaches some of these very cases to which the terms degenerative and incurable have been applied, forcing us to recast our conceptions of these states.

It is often maintained that the results of the psycho-analytic treatments are incommensurate with the time expended on them, and indeed it is obvious that the method is not applicable in its complete form to hospital practice or even to large numbers of private patients. So fundamental a reëducation as is here attempted undoubtedly takes time. But although these considerations might well deter many a physician from undertaking any adequate treatment of psychoneurotic patients—*for no other treatment accomplishes so much in so short a time*—the argument is meaningless as a scientific criticism of the value of Freud's method, while from the practical standpoint it need only be said that it is fortunate that there are so many persons of marked ability whom the need of spending the needed amount of time does not deter. It would be a great loss for psychology³ and

² In speaking of this point I have in mind some remarks made by a speaker [Dr. Barker] during the discussion of this paper as first read, and I take the liberty of adding these few words with reference to his statement.

practical medicine and for education if this was not the case. No one, hereafter, can make studies of human character or of the psychology of childhood without constantly referring to these researches. The men who are conducting them are not mere therapists; they are scientific investigators of high grade, investigators into the anatomy and physiology of the mind, which is a far more important and now a more promising research than that into the anatomy and physiology of the brain, so far as the laws of thinking are concerned, and they deserve sympathy and support. Even in hospital practice, the facts that these men are collecting and the principles which they are establishing will prove of the highest value, and the men who now criticize this method will use their data without knowing it, perhaps indeed are using them already.

My own observation has led me to see at once the value of the method and the difficulty of getting the best effects from it. Not only has my experience been brief but I have not been able to secure the daily visits over a period of three months or more that Freud advises. Three visits a week, and sometimes less, or daily interviews during one to four weeks and then infrequent visits for a longer time is the best that I have been able to obtain. I do not recommend such departures from the rule and can clearly see that they have impaired my own success. We should observe the same conscientiousness in this matter that is shown by the followers of Wassermann in the selection of blood-tests for syphilis. The best that can be said for the half-way measures is that they have demonstrated success to be a matter of degree and have shown that even partial results may be of great practical value. But these partial results, with which one is tempted to rest satisfied are rarely satisfactory in direct proportion to the length of treatment. After a certain point the improvement becomes much more rapid, in some instances, while in others a climax seems to be reached, perhaps fairly early, beyond which it is hard to go. One reason for this arrest of progress obviously

³ The study of psychology is largely a study of the unconscious mental life and there is no means of investigating this through actual observation, which at all compares with the psychoanalytic study of dreams and repressed thoughts. Cf. Freud's *Der Witz*, *Psychopathologie des Alltagsleben*, and the many *Schriften zur Angewandten Seelenlehre*. Indeed the whole great literature which Freud's researches have stimulated has a well-defined psychological interest.

is that the mental and moral capacity of a certain proportion of these patients is not only inhibited but inherently limited in power and scope, while others are unusually intelligent. Temperamental differences between patient and physician likewise come in, as well as inertness and lack of knowledge and experience on the latter's part. The task demands a man's best powers. It is therefore impossible to give a definite answer to the question how long these treatments should be continued, just as it would be impossible to say how long a violinist should continue studying with an able master, or how long any man should continue trying to develop his own character. Some intelligent persons gain a great deal in a few interviews, others find it of service to go on indefinitely; but, in the latter cases, physician and patient usually get to be students of the subject on almost equal terms. If the physician begins by being a psychologist the patient often ends by becoming one.

This question as to the length of treatment links itself naturally with another, namely, how far should the analysis be pushed with regard to any given point, as, for example, in the study of a dream. Theoretically, there is no limit to the process of passing from one thought to another by the method of association. Every thought, every image has some relation, either of resemblance or of contrast, with every other image. One might start with a chipmunk and wind up with the French Revolution or Buckle's *History of Civilization*, and it must be a matter of judgment to decide how much of the possible material which the method of association could be made to furnish was actually in the patient's mind as a material portion of his latent dream thought. In practice, no one need fear that he will carry the dream-analysis too far. It often happens that the associations which seem the furthest fetched are of the greatest service. What is true of the associations suggested by dreams is true also of those suggested by words or thoughts. A "common-sense" person would say that each of his words meant one thing and no more. But every thoughtful student is aware, especially since Jung's remarkable researches, that many words have a richness of meaning which was acquired only through a long series of significant personal experiences on our part, experiences which our memories once recorded, consciously or unconsciously, and could still, perhaps, reveal. A word may be made to furnish the epi-

tome of a lifetime. And so, too, when we say of an object that it has this or that characteristic we do so by virtue of an infinite number of memories of similar objects which guide our judgments although not present to our conscious thoughts. But while, in theory, all our past experiences are living factors in the decisions of each moment, the experiences which we mainly need to seek for therapeutic purposes are grouped around a relatively few centers, with which they form emotional complexes of important sorts; and these come to the front in any searching analysis, when the internal resistances have been dispelled.

It is usually possible to tell when the patient's thoughts get wandering into useless channels but strangely enough it rarely happens that they do so, and the physician is far more likely to be satisfied with too little than to obtain too much. A large group of thoughts, acts, and memories may have a single emotional nucleus for its center or may all be related to the same trait of character, the instinctive tendency to make one's self a center of interest and sympathy, for example. Therefore the patient's associations are more likely to lead him to give more and more illustrations of one trend than to wander in too many trends. Certain trends or complexes are far more important than the rest and this is especially true of those which keep alive in the grown person the traits of infancy and childhood. Freud's service and that of his followers and colleagues, in dwelling on the tendency to this survival is certainly immense,⁴ and although there are certain of his statements that I have thus far found it hard to verify with anything like constancy yet I have been so amazed at the accuracy of others that I expect to re-affirm them all.

It is well known that Freud's method of procedure is to let the patient lie down in a recumbent or semi-recumbent position, under the real but not the apparent inspection of the physician, so that what he says and does may be devoid of constraint, a species of soliloquizing rather than a conversation with another person. Instead of this I have let the patients assume what attitude they liked, often moving about the room, myself, and seeking to give them the opportunity to talk into the air if they desired, or to converse if this pleased them better. I believe that individual license should be allowed in these respects, but it becomes soon

⁴ Cf. Freud's recent study of Leonardo da Vinci.

obvious that the best results are only to be obtained through great thoroughness, insistence and persistence.

The best means of indicating the sorts of results which a person of no more experience and training than my own may hope to reach will be to outline a few of my observations.

The first case to which I will refer is that of a studious and high-minded woman, now 41 years old, of the conscientious, somewhat neurotic type so common in New England, who filled a sedentary and literary position in a country town. She came to me first in January, 1907, i. e., two and a half years before the psychoanalytic treatment in its latest form was undertaken,⁵ though from the beginning I had kept some of its principles in mind. The case was one of universal doubt, with the usual Wandering-Jew inability to find rest in any proof. In the beginning she announced timidly that she could not rid herself of the idea, the history of which she could in a measure trace, that plants and trees suffered like men, so that cutting and breaking them caused them pain. Later, she disclosed that similar doubts extended to all evidence, even about her own identity, her own name. Argument, as is usual in such cases, proved of no permanent avail; abundant encouragement, and directions how to sidetrack her painful doubts helped more, but secured only temporary gains. She did her work with care and interest but was never, even for a moment, free from a painful sense of nervous strain, a haunting dread of insanity and sometimes even suicide.

A year ago I began a systematic investigation of the facts, and this has gone on ever since, with steadily increasing interest on both sides, although very slowly because I could rarely see the patient more than once a week. I must pass over the whole picturesque history as finally developed, important bits of which are even now coming to the light, and the evidences of gradual but steady and I believe durable improvement. Suffice it to say that the case fully bears out the view that these obsessions of doubt, although of course implying the existence of a certain something which is inherited, are virtually due to an inability on the patient's part to arrive at a judgment satisfactory to themselves with reference to certain particular moral questions involving a sense of

⁵ If the physicians who feel that these treatments run along indefinitely will consult their record-books, they will find that, as in this case before the psychoanalytic treatment was begun, their patients keep returning to them through years, no matter what sort of treatment they had used.

personal mortification; *i. e.*, to a series of particular doubts and misgivings, inadequately faced, inadequately understood. It may indeed be true that if we possessed the power to investigate accurately the psycho-physical or even the physiological reactions of such patients⁶ we should find, from the moment of their birth, something which might count as a predisposing tendency, not indeed to "doubt" as such but to a psychopathic disorder of some sort. This probability is borne out here by the fact that this patient's sister suffers from morbid fears of certain sorts but not from doubts. The general tendency to doubt, however, to doubt about everything, although eventually it exists as such and remains hovering in the air, as it were, waiting to attach itself to some or any special problem is probably always, in large part, the outcome of particular doubts.

This patient had had a happy childhood, but the father died when she was very young so that the children came wholly under the mother's influence, and while this was very good in most respects and the traditions in the household were of wholesomeness and refinement, yet the very fact that this was so played its part in intensifying certain of the patient's morbid traits. In looking back she realizes not only that she was imaginative and given to day-dreams, but that her temperament was very ardent and filled her with desires which had the sexual instinct as their central point. This led her to certain acts and thoughts which eventually brought a sense of mortification, and then the contrast, in her mind, between her assumed backsliding and her mother's standards, intensified by the fact that she felt that her mother could never understand her and that she could not claim her confidence or give her own. She thus suffered silently from mortifications and doubts about sexual faults and unanswered curiosity about sexual facts, a curiosity too strong to master but acknowledged with humiliation. When a very small child she was induced, as a bit of fairy-story play, to make a mock marriage with a small-boy playmate, and this was attended with certain ceremonies⁷ that seemed at first trivial but at once introduced a sense of guilt. Then there came a period of masturbation, with sexual visions, and although this experience, like the other, was overcome after a time, and for a time, almost forgotten,

⁶ Cf. Adler, *Studien über Minderwertigkeit der Organe*, Berlin, 1907.

⁷ Passing water in common, the patient being in a tree overhead.

yet subsequent events brought both to active life. Later, there came a few trifling indiscretions, not of act but thought, that no outsider would have thought twice about but which to the patient, then a grown woman, seemed to imply an unendurable contradiction of her moral training and traditions. The intensifying conditions were several in number. A book, accidentally glanced over, said or seemed to say that masturbation led to insanity, and the mental picture of insanity was brought near by a number of incidents (the observation of insane persons, the discovery that certain acquaintances had "gone wrong" and had had a tragic history) such as everyone experiences and most persons without harm. One other fundamental fact must here be mentioned. This lady, refined, sensitive, modest to a fault, had, as has been noted and as she recognized with terror, an emotional nature which, consciously and unconsciously, she was constantly striving to repress. Certain personal experiences, subconscious emotions illustrated by certain dreams, brought a series of ideas connected with the brute-animal creation into the circle of these emotional thoughts, and a passage from the Old Testament, relating to this matter, induced a new sense of guilt vaguely mixing itself with the memories of the early habits, memories which became rekindled through a vaginal examination conducted by a physician of a stern manner who for her inflamed imagination figured as a detective. I have indicated only a portion of the facts that slowly came into the light of the patient's conscious memory, but enough to show that here was a tangle, made up of natural desires gone astray, needless self-reproaches, fears of discovery, fears of insanity, the assumed condemnation of science and the Scriptures, the assumed abandonment of her maternal standards.

In the midst of this network struggled the patient, like a fly in a spider's web, feeling her life a contradiction, her mind diseased and so unworthy of her trust, and yet unable to see and face the causes of her distress. What wonder, that, as the result, she reasoned herself to be incapable of reason. What wonder that she could not extricate herself unaided, when she could not even recognize the facts, not to speak of working out the reasoning. What wonder that the earlier encouragement and the explanation, playing with a few facts that only covered over and concealed so many more, benefited her so little. The

question is often asked, not only by patients but physicians, to what good is one's past life raked over in this fashion? How can the mere conscious recognition of such experiences annul their influence? This case was one that materially helped me to conclusions on these points. Although her revelations were a cause of obvious and peculiar suffering, yet she has felt what everyone who seriously works by this method comes to feel, that it is a great relief to understand one's enemy; to exchange an emotion of terror for a knowledge of the facts and for problems that can be intellectually faced.

I have elsewhere used the illustration of Gen. Braddock's brave, well-equipped and well-drilled army, gasping in the Virginia wilderness, shot at by unseen foes, whom, if they had been wise enough, they might have prepared themselves to meet on equal terms.

If it is at first mortifying to reveal and come to the knowledge of one's weaknesses, this feeling fades gradually away; first, in the light of the discovery that the personal weakness illustrates an important fact in the psychological and physiological history of all men; next, before an increasing respect for knowledge and a growing hesitation to pass judgments or to listen to them, tendencies which the physician, whose education also is at stake, soon learns to share. The general outcome, in this case, has been an immense gain in confidence and comfort.

I have observed several cases analogous to this with the same ending of false reasoning, and one of them deserves mention because the evolution of the symptom was acute and almost under observation. The patient—whom I never saw but for a few times—was a bright, intelligent young girl who during a marriage engagement with a young man of good business standing was tempted by him into sexual indulgences, not of an extreme sort, but such as to plunge her into a considerable mortification. At the time I saw her, which was directly after these events, everything she did was, in her estimation, wrong. She herself saw and avowed the genesis of this tendency to generalize her special self-condemnation, and after some further explanation she seemed in a fair way to recover her lost balance. But the correcting knowledge was none too soon received.

The next case concerns a patient in early middle life, married and with several children. He had become a torment to his family

from a habit of unreasonableness and exaction, carried to the point of being a thoroughly morbid impulse, a species of sadism as it later seemed, not unmixed with a readiness to receive blame for which the designation masochism would be equally in place. This habit was combined with excellent health and great charm, on the one hand, and a tendency to certain childish-seeming ceremonial observances, upon the other. Without a little prompting from partially informed friends or an ability to guess based on the marvelous array of data collected by Freud and his colleagues, I might perhaps have treated this patient forever without reading the riddle of his life. Nor would the mystery have been lessened by the occurrence of furious attack of maniacal delirium which necessitated the isolation of the patient for a period of several months. In the end all became fairly clear. It was a case of aberrant emotionalism of childhood prolonged into adult life; and with a strongly marked but eccentrically developed, erotic nucleus. From beginning to end there had been a series of painful conflicts between desire, taking the form of (mutual) masturbation, then of an instinct to show power and to inflict pain, all, mixed in and followed by periods of intense self-condemnation, expiation, propitiation. The expiation took at one time a religious turn, at another that of handwashing,⁸ at again another, of confessions in and out of reason. The maniacal seizure was, I believe, a prolonged hysterical attack or dream-complex; for the delirium, every detail of which was eventually recalled, was a duplication of lesser dreams and fancies from which Dante might have found fruitful suggestions for his *Inferno*. Fortunately, a steady improvement has set in, as the result of psychoanalytic treatment, and there is an excellent outlook for a bright future.

In looking back upon the treatment of this case I can see, here also, that in my mistaken efforts to save the patient's feelings I frequently attempted to explain too much, at the risk of failing to ensure that the sequences of thoughts and acts, the reversions to childhood-traits, the significance of sexual dreams, should be recognized at their full values through being worked out piecemeal by the patient. Certain of the masters of this method have noted that the patients, after the conclusion of a successful

⁸ The patient had soiled his hands by passing urine on them as an erotic ceremony, and the washing was, as is usual, a species of instinctive acknowledgment of guilt and attempt at expiation or reparation. •

treatment, show a desire to cut loose from their physician and to attribute their improvement to other causes, and that they seem to feel no sense of gratitude. This is unfortunate and, I believe, usually unnecessary, but in so far as it means that the doctor has done his full duty in insisting on a recognition of the facts it may be a useful sign.

In both of the above instances the attempt was necessarily made to modify tendencies which had been operative from childhood to well into middle life. The next case concerns a somewhat younger person and the problem was correspondingly easier.

This patient is a young lady of 33 years who came to me first in 1908, *i. e.*, about ten months before I was able to institute a thorough treatment by the psycho-analytic method. She was in excellent physical health and her symptoms consisted in a morbid shyness accompanied with a frequent tendency to tears, and in a fear of the need of passing urine which made visits to strangers—especially to a physician or to a dentist—or even short train-journeys or boat-journeys a source of extreme misery. Some portions of her history, including the fact that she had recently made and broken an engagement to be married, were told to me at once. It was a relief to have established this bond of confidence and the explanations and encouragements given during the period before the psycho-analytic treatment was begun resulted in a gradual gain, so that the patient became able, though not without distress, to conduct an occupation involving initiation and slight publicity, and to make a long journey with some friends. The later analysis showed a very interesting personal and family history. She had been a child with a passionate temper and strong desires, and had been brought up strictly and injudiciously by well-meaning but narrow and bigoted parents, of but few social advantages and many foolish prejudices. The mother was an uncontrolled neurotic, the father hard and aged. Her entire childhood and adolescence had been marked outwardly by repressions and outbreaks against repressions and inwardly by mental conflicts of analogous sorts. Through it all there had been a constant surging of desires and cravings which if properly sympathized with and directed from the outset would readily have made the patient a warm-hearted and affectionate person, even if impulsive. Unfortunately, besides being unlucky in her home surroundings she was unlucky also in her school companions.

At least it must be said that the tone of morals among many of them was low and that sexual topics were discussed freely and in unsavory terms. The subjects of discussion included naturally the nature of marriage and the birth of children, and the girl was given a picture of brutality on the part of husbands and informed that child-birth was accomplished by the aid of a "butcher's knife" with which the abdomen was laid open. The nervous disorder of micturition obviously resulted from unwise parental toilet-rules *plus* a variety of sexual associations. Her instincts led her into various slight excesses resulting in a sense of humiliation and reproach. It is easy to imagine how on this soil the signs of a morbid shyness and self-consciousness should have grown rank, and it is satisfactory to be able to note that marked improvement has taken place in all respects. The excellent plans for reëducation so carefully laid down by Janet as applicable to such cases was immensely re-inforced by the complete knowledge of the facts obtained through the psycho-analytic method. The study of the patient's dreams was an indispensable means of embracing in this knowledge the working of the unconscious mental life and the half-recognized desires of the conscious life.

The next case is of special interest, because the patient, an unmarried business man of middle life (46) and of excellent physical health, had had his distressing mental symptoms (self-consciousness, embarrassment, doubts, sense of depreciation, etc.) since early childhood, and because he had for a long time been under the care of other persons, one of whom—a neurologist of the first rank—had tried for a short time to study and treat him with the aid of hypnotism, but without effect. The outlook did not seem promising for the removal of symptoms so fixed that they were woven into his character and temperament. He had been under my care off and on for about a year before I attempted this more searching study of his life, but I was nevertheless amazed to find how much there was still to learn about him and the intimate causes of his illness. So ready was he, at first, to reiterate, at each visit, what seemed only the tiresome complaints of a hypochondriac that I should have been glad to abandon the new effort and indeed suggested doing so. But, fortunately, he was intelligent enough to see the merits of the plan and desired me to keep on. I soon came to have a deep knowledge of his history from the age of four, at which period a strongly

emotional (erotic) tendency began to show itself, and also of his relations to his parents and his friends, and was able to trace the evidences of his temperament in his business-dealings. In proportion as this insight was gained improvement in his self-control and mental bearing began to show itself, and this has steadily increased. One of the marked features of his early life was, as in the second case reported, an obsession of morbid conscientiousness and of expiation, and even when he was entering on manhood this childhood, fairy-story trait retained a ludicrously powerful hold on him. In this respect he had improved before he came, under my care,⁹ at least so far as the grosser features of the tendency were concerned. But the endless conflict of motives, the self-conscious torturing of himself, went on in lesser forms. As matters now stand he is able to take a far more rational position before himself and before the world, and can see, and more readily check, the working out of his infantile passions and repressions, of his parental domination and his early training, much as one sees at one glance in a transparent microscopic-section construction of the brain the whole course of a great neurone-tract.

In such a picture of a life the element of time seems to be abolished and childhood and age are seen as if now present and coalescing, in an effective form.

It is idle to make the claim that where one is conscientiously attempting to aid a patient thus hampered with long-standing morbid habits, the aid obtained through this intimate knowledge of his past, this power of seizing the lifetime in one grasp, this unraveling of the unconscious mental life obtained through dreams and other means are not worth having. Such a claim is the contention of ignorance. The whole task may be abandoned if one chooses but if it is to be undertaken at all no aids can be dispensed with, and the advent of still another Freud, with still further insights, should be welcomed if he came.

The next case is of considerable clinical and scientific, as well as of therapeutic interest. The patient was a lady, fifty-three years of age, and so beyond the period when marked improvements are relatively easy to obtain.

The case was one of a hysterical *petit mal*, the attacks being so severe that the diagnosis long remained in doubt. Many of

⁹ It is certainly true, as Janet indicates, that spontaneous improvement sometimes occurs, in these cases.

them have occurred under my observation, once under that of my colleague Dr. G. A. Waterman likewise, and I can therefore positively assert that the knee-jerks regularly disappeared and remained absent for from one to several minutes, then returning gradually, and that the same statement can be made as regards the light-reaction of the pupils. This observation stands among a very few of equal value.

I cannot give, at present, the details of the interesting history which was gradually obtained, or of the improvements and discouraging relapses. Suffice it to say that the patient had had two long series of emotional strains, lasting through many years, both of which tended, in different ways, to induce the idea and habit of muscular abandonment, of giving way and the letting go of all control. In other words, the sign was fairly to be taken as symbolizing this mental state, a conclusion reinforced by the analysis of her dreams. The particular exciting causes of the seizures were various excitements and surprises such as would naturally excite a relaxation of attention even in slight degree.

After a time I discovered that I could bring on attacks by talking about them and thus getting the patient into an attitude of expectation.

Attempts to induce the hypnotic sleep or a suitable hypnoid state were not successful in my hands.

The therapeutic outcome has been, at last, not recovery, but a marked relief from symptoms which for a dozen years had been a very serious handicap to the happiness and activity of a very intelligent and useful person.

The next case of which I wish to speak is one of importance, being that of a well-balanced, intelligent, middle-aged, businessman, who had never, in his married life of five years, been able to have satisfactory coitus, a cause of mortification and regret. I had treated him carefully and energetically for a long period, with electricity in various forms, stimulant perineal douches combined with other hydrotherapeutic measures, full doses of johambin,—long continued,—strychnia and other tonics, and had done my best to help him by encouragement and explanation and with attempts at hypnotic influence, but absolutely without avail.

In spite of these discouragements the patient was willing to do his part in carrying out a psycho-analytic investigation and, although it was impossible to secure daily treatments yet the

result has been so great improvement as to substantially mean recovery. The three influences which this investigation brought out, as possible causes of the impotence, were, first, a sense of mortification attending the memory (half-conscious and perhaps, still more, unconscious) of a masturbation-habit prolonged into late adolescence¹⁰; a rather strong maternal influence which may have interfered somewhat with conjugal feelings in spite of the fact that he was a devoted husband; and, possibly, some unfavorable conditions on the part of his wife who, though devoted to his interests and herself desirous of seeing his impotence overcome, was nevertheless a nervous invalid and may well have had exercised the repressions which attend that state. Somehow or other, at any rate, the successful outcome gradually emerged and still persists.

The next case is one of stammering, the patient being a young man of 19, of ability and fine character. The speech-difficulty had begun in early childhood and various attempts had been made to relieve it, of the usual sorts, including a long treatment in the school for stammerers at Detroit.

As the result of these measures he was able to speak fairly well so long as he talked very slowly and rhythmically, but as for the most part this was impossible the net practical improvement was not great. My treatment consisted partly in suggestions and exercises calculated to mitigate some of the more specific difficulties of enunciation (including certain exercises advised by Scripture), but mainly in an attempt to discover all possible past and present causes of embarrassment, in which I believed the essential origin of his trouble lay.¹¹

The outcome has fully justified my hopes and a recent communication shows that the improvement, both in self-confidence and in speech, is still maintained.

It cannot be justly claimed that all other patients treated by this method have made equally satisfactory progress. But while I have had reason to be distinctly disappointed at the outcome in perhaps three cases, there is hardly a single patient who would be disinclined to pursue the treatment further.¹²

¹⁰ Cf. a paper by Ferenczi, where this same origin was made out.

¹¹ Adler (*Studien über Minderwertigkeit der Organe*, Berlin, 1907, later papers) believes that there is also an innate defect in the speech-mechanisms in these cases.

¹² I will say again, as I have said before, that a treatment of this sort should not be undertaken unless it can be carried out in a fairly thorough manner. Unless this rule is followed the consequences may be disastrous

The conditions which I have found most resistant have been (1) those classifiable as neurasthenic, of long-standing and disabling sorts; (2) distressing mental depressions and phobias related to causal circumstances that still persisted, and (3) anxiety-neuroses where it was impossible to secure the conditions of the sexual life favorable to improvement, or where a strong admixture of neurasthenia was present. Here, the resources of "sublimation" should be fully utilized, and this subject needs more working out.

In a second case of stammering the patient felt unwilling, in spite of some signs of gain, to pursue the investigation to the needed limit.

I have found it of great service to gain a practical familiarity with the true meaning of typical symptoms, typical dreams, the related symbolism of dream-life and waking life.

I could almost point to the moments when I first learned clearly what was meant by the conversion of desire to fear; the relationship of death and pain to the sexual instinct; the significance of the parents for the mental development of the child; the tendency of the neuropathic patient unconsciously to seek ever new objects of desire, etc.

The power to recognize promptly the presence, under ever new forms, of the tendencies here at stake, gives a chance for shortening and systematizing the analysis and treatment.

It is a cardinal point of Freud's doctrine, as everyone is aware, that it is to the experiences and repressions of the period of childhood, when fact and fancy, untaught emotion and newly arisen moral sense, yield strange conglomerations of motives and emotions—gladly escaped from, gladly forgotten—to which we are to look mainly for the origin of the mental twists which terminate in neurotic illness.

The law of least resistance tersely explains how it happens that this great drama of childhood, played largely within the unconscious mental life, gets to be repeated over and over again in adult years, but this principle needs to be supplemented by a great deal of detailed information respecting the remarkable tendencies which are at work during the period of transition from infancy to childhood. The recent study by Freud of the mental characteristics of Leonardo da Vinci,¹³ Dr. Ernest Jones'

¹³ *Schriften zur angewandten Seelenlehre.*

study of Hamlet¹⁴ and Jung's Clark University lectures¹⁵ hint at some of the forces here at work. A year ago I should have regarded these observations and conclusions as fantastic. But here, also, my personal experience has led me to an entire change of attitude and I look confidently for more and more practical results in education and prophylaxis, based on researches such as these. The subject is too large to enter on in this place.

In conclusion, I wish to say that while I have referred, throughout this paper, to Freud's work and doctrines as if he was their only exponent, yet I fully recognize that this is not the case. Not only is the literature which has grown up of late years, under the influence of these researches, already very large, but it is also true that the related literature of an earlier period, both lay and medical, is eminently corroborative of the principles and conclusions which Freud has with such marvellous skill made systematic and thus available for further progress. I have not undertaken even to say a word of my debt to Jung's important observations in the finer use of word-association tests. I have here no new contributions to offer but, so far as my observation goes, can express verification and acknowledgment of his investigations.

It should be realized by every fair-minded person that in judging of the work of this growing school of able men, a separate estimate should be made; first, of the method which they use, next, of the conclusions which they reach. The former, at least, is of immense value for the ascertaining of a sort of truth hitherto concealed. Let the method be conscientiously followed and the conclusions will need no special advocacy.

¹⁴ American Journal of Psychology, January, 1910.

¹⁵ American Journal of Psychology, April, 1910.

MULTIPLE SCLEROSIS WITH PRIMARY DEGENERATION
OF THE MOTOR COLUMNS AND HYPOPLASIA,
PRINCIPALLY OF THE BRAIN STEM

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We present the following case because we have been unable to find a similar instance in the literature and because of its unusual and interesting features. The history is as follows:

The patient was a single man, a dyer by occupation, and when admitted to the hospital in 1897 was 36 years of age. His family and own previous history was unimportant and he never had syphilis. He was apparently well until four years before observation, when he developed tremor of the entire body including his head, and his gait became uncertain, staggering like a drunken man. He then also complained of headache and dizziness. Following this his legs became stiff and weak, especially when attempting to walk. He gradually developed difficulty in talking and eating, his eyes watered constantly and he had considerable dribbling of saliva.

When admitted to the hospital these symptoms were all advanced, and from this time until his death, eleven years afterwards, notes were frequently made of his condition. In brief, the history is that he was able to walk only for about two years after admission, his legs becoming progressively weak and stiff, especially the left leg, his gait being both spastic and ataxic, increasing to such an extent that he became chair-ridden. The upper limbs were, from the first, weak, spastic and ataxic and this condition progressively increased in both upper and lower limbs, and in later years when any attempt was made to have him stand he would stagger and fall. His tendon reflexes were always exaggerated, patellar and ankle clonus could be obtained and the Babinski reflex was prompt on both sides. He never had difficulty with his bladder and rectum and there were never noted

disturbances of sensation, although at times he complained of numbness and pain.

His sight was only a little impaired and his pupils as well as their reactions were always normal. He did have, however, very early in his disease ataxic movements of the eyeballs, especially on lateral deviation (nystagmus). Hearing and taste were normal.

Soon after the beginning of his symptoms the patient had involuntary laughing and crying and diminution of his emotional control, and in later years was entirely unable to control his emotions, and whenever any attention was paid him his face would flush, eyes water, he would cry or laugh, and sometimes there would be a mixture of both. He would hardly ever keep his face in repose for more than a moment or two and any attempt on his part to talk or eat, or in fact use any of the muscles of his face, would cause him to cry or laugh. When he was asked to show his teeth or protrude his tongue he would immediately give way to his emotions, although when drawing back the corner of his mouth he was able to control the movements on the right side more than on the left. It was especially noticeable that the lower part of his face took very little part in the emotional act, this consisting nearly always of a contraction of the orbicularis muscles and a drawing up of the upper part of the face, with profuse laceration, dribbling of saliva which was thick andropy and flushing of the whole face.

The tongue was small, could be protruded only slightly beyond the teeth, and its movements were weak in all directions. When saying "ah" the soft palate would move only slightly. At no time were there noticed fibrillary tremors in any part of his face or tongue or in fact in any part of his body, and neither was there any wasting. His speech was thick, slurring and indistinct, its unintelligibility becoming progressively more marked. This was partially due to the interference of speech by his emotions. In detail he had difficulty in articulation, in vocalization and enunciation. When attempting to swallow water it would regurgitate through his nose and he would often choke, and he had besides difficulty in chewing and eating. Ophthalmoscopic examination was always negative.

The autopsy was performed within twenty-four hours after death by one of us. The brain was smaller than normal but it was unfortunately impossible to determine the weight at the time of the necropsy. There was no abnormal hardness noticed in any part of the brain or cord, the structures having their usual soft consistency. The convolutions were well formed but the pre- and postcentral were atrophied, inasmuch as the fissures, especially the central and precentral, were wider and deeper than normal. The pons was very small, not much larger than the medulla, and the middle cerebellar and cerebral peduncles were

atrophied proportionately to the size of the pons. The medulla oblongata was possibly a little smaller than it should be. The cerebellum was smaller than normal but the convolutions did not appear atrophied on gross examination. No macroscopic lesions were found anywhere in the brain or brain stem, but both internal capsules were small, especially the posterior limbs in their transverse diameter, and the internal and external geniculate bodies and thalami were diminished in size. The spinal cord was apparently a little smaller than normal.

Microscopic Examination.—There is a degeneration of both motor columns which can be traced from the upper levels of the internal capsule into the lowest level of the lumbar cord, the degeneration being fairly well marked and more so in the left crossed and right direct pyramidal tracts and in the peduncle and internal capsule of the right side.

Spinal Cord.—Sections made from all levels show a distinct degeneration of moderate degree in the crossed pyramidal tracts on both sides, and in the cervical and upper thoracic in the direct pyramidal. By the Marchi method no fresh degeneration is found, it showing, however, an old degeneration. There is no meningitis and the cells of the anterior horn are normal. The anterior and posterior roots are of the usual size but here and there in different sections islets of sclerosis are seen.

Medulla.—Sections from all parts show distinct reduction in the size of the pyramidal bundles, these being very much flattened, but the other parts of the medulla are apparently of normal size. The pyramidal tracts are degenerated, more on the right. All the olives are normal in size and there is no degeneration in the cerebello-olivary tracts or in the internal or external arcuate fibers. The restiform bodies and the lemniscus stain normally. The nuclei of the twelfth, eleventh and eighth cranial nerves and their intramedullary fibers are normal. There is some degeneration in the nuclei of the ninth nerves and also in some of the cells of the nucleus ambiguus. The anterior part of the solitary bundle on both sides, but especially on the right, is slightly degenerated. There is no meningitis.

Pons is uniformly small in all parts, it being just a little larger than the upper portion of the medulla. By the Weigert hematoxylin method there is a rim of well-stained fibers in the periphery of the sections, the centre showing only few myelinated fibers which do not stain as well as those of the periphery. By the Weigert neuroglial and acid stains, the parts which appear light by the Weigert hematoxylin method show a dense neuroglial infiltration, which consists of a network of neuroglial fibers and some cells which have the typical appearance of spider cells. The infiltration is of varying intensity but around the vessels, which seem to be numerous, there is a thick band of interlacing neuroglial fibers whose breadth is about the size of a blood vessel.

In other areas in which there are remains of blood vessels there is a similar neuroglial band. Towards the periphery of the sections the neuroglial infiltration becomes less, and by the Weigert hematoxylin stain presents a moth-eaten appearance. Very few myelinated fibers can be found in the center of the section, but towards the periphery there is a gradual appearance of fibers, the transition being in some places gradual and in others abrupt. The degeneration involves especially the motor fibers, the transverse pontile fibers and those of the fillet, while the superior cerebellar peduncle and the posterior longitudinal bundle are not so much involved. There is no secondary degeneration for different levels, as for example, sections of the posterior longitudinal bundle, and superior cerebellar peduncles made in close proximity show degeneration in different parts. By the silver stain many of the axis cylinders persist, although they are not as numerous as in a normal section. The intrapontile nuclei are diseased everywhere but only to a moderate degree. The nuclei of the intramedullary portions of the sixth, seventh and eighth nerves are normal. Some of the cells of both motor and sensory nuclei of the fifth nerves are degenerated on both sides and the intramedullary roots are distinctly degenerated.

Cerebral Peduncles.—The pes pedunculæ is small and proportionate to the size of the pons, the atrophy being mainly in the ventral portions. The corpora quadrigemina appear to be of normal size. The red nuclei are small but well stained and there is no degeneration within them. Most of the cells of the third nuclei are normal, although here and there a diseased cell can be found, but their intramedullary fibers are normal. There is some diffuse degeneration in the fillet on both sides, but more on the right. The feet of both peduncles are very small, especially of the right, and on account of the smallness it is impossible to definitely tell which part is degenerated, but its central portion seems to be most involved. The left foot is larger than the right and there is some degeneration in its middle.

Sections higher up taking in the internal and external geniculate bodies and the pulvinar and above the nucleus of the third nerve show still a smallness of structures. The red nuclei are well marked and stain normally, but the peduncles are abnormally small. In one, the left, there is a fresh hemorrhage about one sixteenth inch in width.

Internal Capsule, Left.—Horizontal sections were made at different levels. The lower shows a degeneration in the anterior half of the posterior limb. There is a diffuse degeneration in the fibers of the external capsule and also in the fibers which go to the island of Reil. Sections made at a higher level show a degeneration in the anterior half of the posterior limb and some degeneration in the knee and the adjacent part of the anterior limb.

On the right side changes similar to those described in the left

are present, but more marked, and a small area of softening is found in the lower level of the lenticular nucleus adjacent to the posterior end of the internal capsule. At a higher level the internal capsule is well marked but the size of the posterior limb is considerably smaller than that of a normal specimen, and smaller than its fellow, which is also smaller than normal. The fibers traversing the internal capsule in a horizontal direction for the most part stain well. The projection fibers show most degeneration.

Cerebellum.—Sections made perpendicular to the middle cerebellar peduncles show a marked lessening in the breadth of the cerebellar hemispheres, this being entirely due to the smallness of the white matter, the cortex being normal. Comparing it to a normal cerebellum the white matter is about one third the size. Microscopically there is a diffuse neuroglial infiltration in the white matter, the character of which is similar to that described in the pons and is equal on both sides. The dentate nucleus in places escapes, then again only traces of it can be found. In those parts in which it is fairly well marked it appears smaller than normal. The degeneration of fibers is apparently dependent upon the neuroglial infiltration. There is no diminution in the size of the cerebellar cortex but the number of Purkinje cells is diminished and many diseased cells can be found.

Cortex.—Sections taken from various portions, this including the frontal, temporal, occipital and especially all parts of the central convolutions, show a somewhat uniform appearance. Here and there, but principally in the white matter and especially in the central convolutions and under the island of Reil, there are areas of sclerosis of irregular size, some larger than others, but many can only be detected by the microscope. By the low power they appear lighter in color than the surrounding tissue but are by no means of uniform color, some being lighter than others. By the higher power their margins are mostly abrupt and the outlines irregular. In following, for example, the normal into the sclerosed areas, the fibers can be distinctly made out but do not stain as well. In the lesser diseased areas there is very little change in the thickness of the fibers while in those which are more involved the myelin sheaths appear smaller, and in some naked axis cylinders can be seen. In following, however, the course of the fibers through any of these areas into normal tissue, both the proximal and distal seem to be normal. By the neuroglial stain there is a glial infiltration which, however, is by no means as dense as it is in the sclerotic areas of the pons. There is no relation between the sclerotic areas and the vessels although either within them or near their border, especially in the larger areas their walls are often thickened. The nerve cells in those areas which implicate the cortex are rarely diseased.

By the Marchi method the tissues do not stain and by the

Weigert hematoxylin stain no lesions are found in the fibers of the central convolution. By the thionin method only few Betz cells can be found in any of the sections taken either from the paracentral lobule or the central convolutions and those present are diseased, being smaller than normal, puckered up, with few dendritic processes, and filled with yellow substance. In many of the sections no Betz cells can be detected. Sections from other portions of the cortex do not show distinct disease of its cells.

Cranial Nerves.—By the Weigert hematoxylin stain there is in both optic nerves, especially in their border, a slight degeneration. With this exception the optic chiasm is normal. The other cranial nerves with the exception of the seventh present no distinct degeneration.

Seventh Nerve.—By the Weigert hematoxylin stain there is a ring of degenerated fibers, this being about an equal distance from the center and periphery of the section, irregular in its margin, presenting mostly an abrupt outline, with normal fibers in its centers. By the neuroglial stain the sclerosed areas show dense glial infiltration with no cells. Serial sections soon exhaust these islets of sclerosis. Within the sclerosis are found here and there degenerated myelin sheaths. In the periphery of the section and sometimes a little distance away between perfectly normal fibers, as if surrounding them, there is a glial infiltration. In other areas the myelin sheaths are replaced by glial tissue, while in still others there is a glial infiltration both surrounding and within the sheath. In the older areas the axis cylinders are retained. There are no vascular changes and no secondary degeneration.

Blood Vessels.—In the sclerotic areas of the pons and cerebellum the vessels seem to be numerous but this is probably because of the smallness of these parts. The walls, especially in the more sclerotic portions, are thickened and some have a very large perivascular space in which are occasionally found a few round cells resembling lymphocytes. In other areas instead of the vessels there are found only lymph spaces partially filled up with fibrous tissue and a few round cells which are evidently the remains of the vessel. These vascular changes, however, are not found elsewhere than in the cerebellum and pons, for in the cortex they are only a little altered and have no distinct relation with the lesser sclerosed areas.

We will first discuss the pathological findings. The whole brain was small but unfortunately its weight was not ascertained at the necropsy. The convolutions were well formed but both pre- and post-central were atrophied and the adjoining fissures were wider and more prominent than normal. The

other convolutions did not show distinct atrophy. Both internal capsules were distinctly small, especially the posterior limbs in their transverse diameter, and more on the right side. The thalami and the external and internal geniculate bodies were also diminished in size.

The most distinct changes, however, were found in the brain stem. The cerebral peduncles and all parts of the pons were greatly reduced in size, cross sections of the latter being only a little larger than the upper portion of the medulla. The middle cerebellar peduncles and the cerebellum were much atrophied, the smallness of the latter being due to the atrophy of the white matter, the cortex being of the usual normal thickness. The medulla and spinal cord were small, but not abnormally so.

Areas of sclerosis were found especially in the pons and cerebellum and diffusely throughout the white and gray matter of the brain and in some of the cranial nerves and to a less extent in the anterior and posterior spinal roots. Besides there was a primary degeneration of the motor columns. The character of these changes will be later more minutely discussed and is only referred to here to emphasize the fact that the sclerosis and atrophy had no direct relation in as much as there was atrophy where there was no sclerosis.

Atrophy of nervous structures is found in different pathological conditions, principally in so-called hereditary ataxia and diffuse sclerosis. The atrophy in the former, however, is the result of a primary parenchymatous degeneration, the neuroglial infiltration being secondary, and the degeneration is systemic.

In so-called diffuse sclerosis there is a smallness or atrophy of the brain but as will be discussed later, the form of the sclerosis in our case was of the type found in multiple sclerosis and again there was absent the particular factor which distinguishes diffuse sclerosis—the leathery consistency or hardness of the brain.

According to Müller (1) the brain in multiple sclerosis rarely shows secondary atrophy, and a smallness of structures is unusual in real multiple sclerosis. In one case, Edwin Bramwell (2) found the spinal cord to be abnormally small. It is improbable then that the great atrophy of the brain stem in our case is the result of the sclerosis, and we believe inasmuch as the whole brain was small, that there was congenital smallness with par-

ticular hypoplasia of the pons, cerebral peduncles, cerebellum, internal and external geniculate bodies, thalamus and internal capsules.

The degeneration of the motor columns was evidently primary in as much as it involved the whole cortico-spinal system, the central convolutions being distinctly atrophied, the Betz cells diseased and the motor columns degenerated throughout their entire course. It is evident that the degeneration of the motor columns was the result of a developmental fault and was in conjunction with the hypoplasia of other portions of the brain.

In addition to the smallness of structures there were also evident on macroscopic examination, principally in the pons and cerebellum, areas of sclerosis which presented the usual light color after hardening in Müller's fluid. Throughout the cerebrum, however, there were other sclerotic areas which had the appearance of diffuse mottling and were most common beneath the island of Reil.

Microscopically there were found two types of sclerosis. One, that which is usually found in multiple sclerosis and which was present principally in the pons, cerebellum, cranial nerves and spinal roots, and secondly a diffuse unusual type situated entirely in the cerebral hemispheres and mostly in the white substance.

Even the first form of sclerosis presented some unusual features from those ordinarily found in this disease. First, it involved the entire pons, cross sections by the Weigert hematoxylin stain presenting only a peripheral rim of normal fibers. In the cerebellum it implicated the white matter principally, although it destroyed a part of the dentate nucleus and many of its cells. The periphery of the sections by the Weigert hematoxylin stain presented a moth-eaten appearance, the degeneration sometimes being clean cut, but mostly fading gradually into the surrounding structures. In the centre of the pons where the sclerosis was most marked, all the structures were destroyed, but in the less degenerated areas naked axis cylinders were found. The intrapontile cells and the nuclei of the different cranial nerves were spared and there was no secondary degeneration. The neuroglial infiltration was very dense. In the sclerotic areas of the pons and cerebellum the vessels seemed to be increased in number but this was probably relative and not an actual increase.

Some of the vessel walls were at times thickened and were surrounded by a perivascular space which contained few mononuclear cells.

The second type of sclerosis was found throughout the cerebral hemispheres but principally beneath the island of Reil, and was confined almost entirely to the white matter. The areas were sometimes of large but mostly of small size and presented by the Weigert hematoxylin stain a characteristic appearance. Instead of being whitish in color, as the sclerotic areas usually are, they stained less blue and in other areas were still paler, but nowhere was there the whitish appearance that the sclerotic areas in the pons and cerebellum presented. Closer view demonstrated that this difference in color came on abruptly and in following the fibers through such an area they presented a thinner appearance, this varying in different parts and only rarely was the myelin substance completely destroyed. The axis cylinders were normal.

The glial infiltration in these areas was at times intense, especially in the sclerotic areas of the cortex. Differing from the sclerosis in the pons and cerebellum the vessels were not diseased within their boundary. In those rare instances in which the sclerotic areas involved the gray matter the cells were often destroyed. There was no secondary degeneration and by the Marchi stain no granular cells or evidences of recent degeneration.

This second type of sclerosis is very unusual and has been described previously only once by Schlesinger (3), who in a boy of seven found three forms of sclerosis, one of which was similar to the second type described by us. He considered his case one of acute or subacute multiple sclerosis or possibly one of encephalomyelitis, and this "shadow sclerosis" as he termed it, the result of the action of the toxin upon the different fibers, believing that some tracts resisted the toxin more than others, and that this type of sclerosis represented an intermediate form.

We are inclined to agree with Schlesinger that the so-called "shadow sclerosis" is probably an intermediate stage of the process, but there is no further resemblance between our case and his, for he found fat and granular cells and some disease of the vessel walls by the Marchi method, showing that the degeneration was acute, whereas we found no such evidence. Again in our case we believe that the cause of the multiple

sclerosis was entirely of an endogenous nature, agreeing in substance with the theory advanced some years ago by Strümpell (4), who described multiple sclerosis in association with syringomyelia, believing that the disease was the result of congenital abnormal predisposition. This with some modifications is the view also held by Müller.

There can hardly be adopted any other view so far as our case is concerned, for, as has already been emphasized, the whole brain and cord were small, and there was a particular hypoplasia of certain parts with an associating primary degeneration of the cortico-spinal motor tracts.

Our case further shows that the glial infiltration is the primary process and that the myelin degeneration is secondary. In sections of both seventh nerve roots there were found islets of sclerosis whose boundaries were mostly clean cut. Serial sections soon exhausted these areas and in their periphery or a little distance away the nature of the sclerotic process could readily be made out. There was principally a neuroglial infiltration between the nerve fibers, and in other areas a replacement of the myelin by neuroglial tissue, and here and there, but well within the border of the sclerosis, a swollen or degenerated myelin sheath. In the older sclerotic areas the axis cylinders persisted, and in the sections away from the sclerotic process, there was no evidence of secondary degeneration.

Another unusual feature of this case was the fact that with the exception of a few islets of sclerosis in the spinal roots, there was no sclerosis in the spinal cord with the exception of the degeneration in the lateral columns. Müller does not believe that there can be exclusively either a cerebral or spinal type although he admits the possibility of a preponderant form.

The clinical symptoms were in every way commensurate with the pathological findings but were different in many respects from the usual manifestations of multiple sclerosis.

It seemed as if the patient's symptoms did not appear until his thirty-second year, when he developed a tremor of his entire body and an uncertainty in gait which was described as drunken. Following this his legs became stiff and weak and he gradually developed difficulty in talking and eating and involuntary laughing and crying. From this time on the bulbar symptoms persisted, the weakness and stiffness in his limbs increased, he be-

coming chair ridden, with increased reflexes, ankle clonus and Babinski.

He had occasional attacks of numbness and pain but no sensory disturbances. The pupils were normal and he had very early, ataxic movements which were probably nystagmic, but which were not distinctly present toward the end of his life, and his eye grounds did not show ophthalmoscopic changes. There were at no time remissions in his symptoms which were constant and progressive. His mentality did not seem to be normal, but its extent was difficult to determine because of the patient's inability to talk.

The case was regarded as one of multiple sclerosis, but towards the later course of the disease because of the constancy of his symptoms, the prominence of the bulbar phenomena and the presence of bilateral motor weakness he was regarded by some as a case of pseudo-bulbar palsy.

Clinically the symptoms presented resembled very much those found in primary degeneration of the cerebellum and its related tracts. Only recently Gordon Holmes (5) collected such cases, reclassifying them pathologically. In many the symptoms were similar to our case, and intention tremors, cerebellar ataxia, spasticity of the limbs and involuntary laughing and crying seemed to be very common. In fact, among the early symptoms in this group of diseases are found cerebellar incoordination and tremor of the whole body.

Müller in discussing the difficulty of diagnosis between these two conditions states that the presence of a hereditary or familial history is against multiple sclerosis, that in cerebellar ataxia the atrophy of the optic nerve is of the tabetic form, that the ataxia of the facial muscles producing disturbance in the emotions is unusual in multiple sclerosis and that ataxia of the upper limbs and trunk which is common in multiple sclerosis is seldom seen in hereditary ataxia. Considering the fact, however, that in our case there was considerable sclerosis in the cerebellum and a remarkable similarity in the location of some of the pathological processes it is not at all unusual that these symptoms which Müller considers unusual should have been present in our case. We only wish to again emphasize the fact that there may be a familial form of multiple sclerosis. Recently one of us (6) reported a family in which there was multiple sclerosis in a

brother and sister. Oppenheim (7) also refers to having seen on two occasions typical multiple sclerosis in two sisters. Such cases are also recorded by Reynolds (8).

Again the clinical symptoms resemble those found in diffuse sclerosis and to a less extent in pseudo-sclerosis. As is well

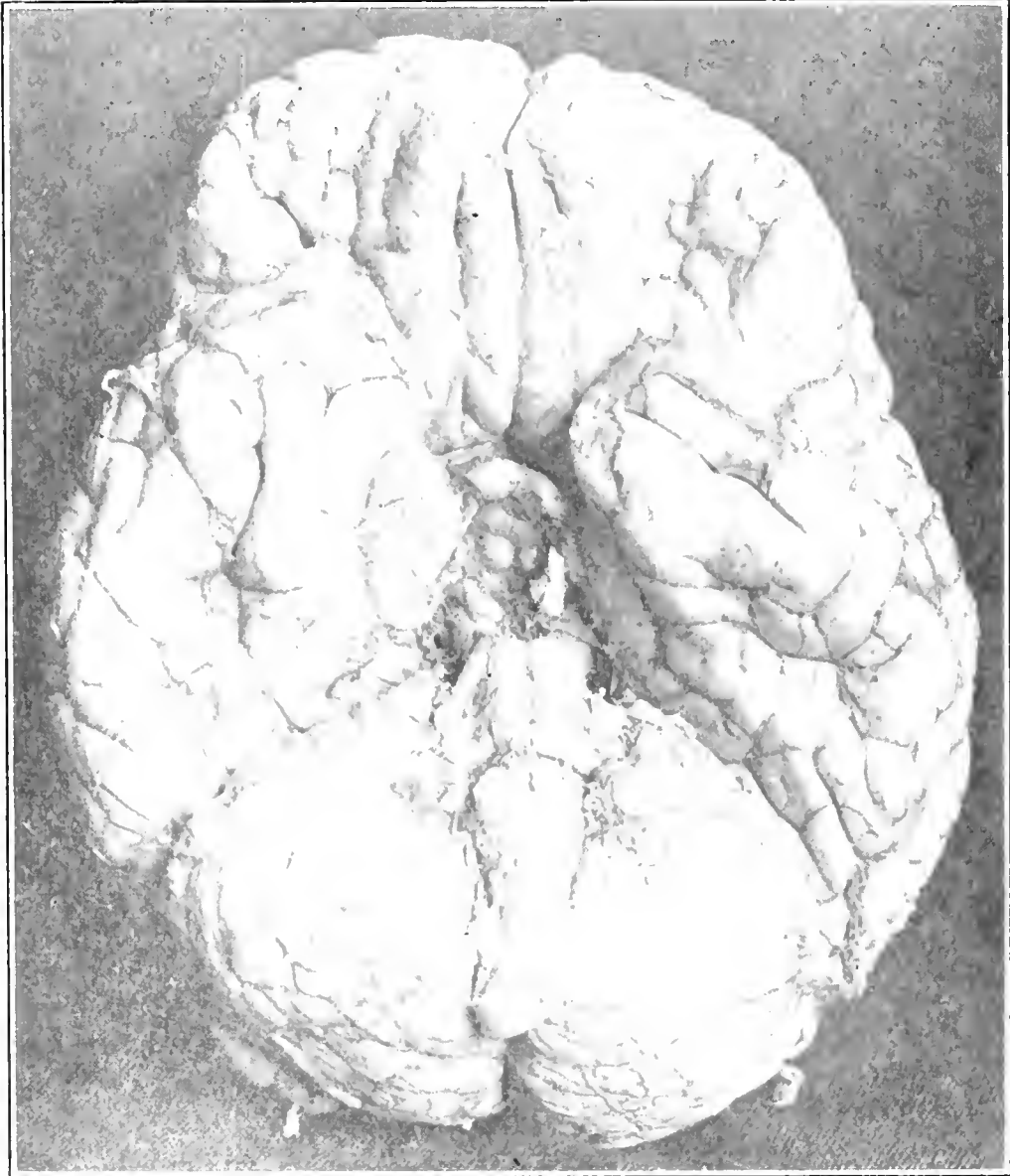


FIG. 1. Photograph of brain showing small size of pons and peduncles, the pons not being much larger than the medulla.

known both pseudo- and diffuse sclerosis are usually diagnosticated as multiple sclerosis and so far as we are aware there is no recorded case in which the proper diagnosis has been made in life and confirmed by necropsy. Oppenheim refers to West-

phall's cases in which the latter states that there are psychic disturbances, absence of nystagmus and of involvement of the optic nerves in pseudo-sclerosis. In our case there was present

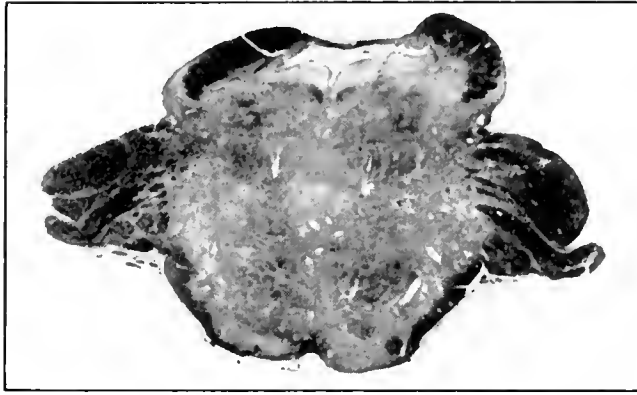


FIG. 2. Enlarged photograph of pons showing character of the degeneration.

distinct mental apathy, and while towards the end of the patient's life neither nystagmus nor optic nerve changes were demonstrated, a slight sclerosis was found in the optic nerve on both



FIG. 3. Photograph of the second type of sclerosis found throughout the cerebral hemispheres.

sides. It is improbable, however, that such constant and severe bulbar symptoms and spastic paralysis of the limbs as that present in our case ever occurs in diffuse sclerosis.

Marburg (9) states that the bulbar symptoms are especially present in the so-called acute form of multiple sclerosis and that the diagnosis is made by the presence of the other symptoms of the disease and by the remissions. In our case they led to a diagnosis of pseudo-bulbar palsy principally because while there was a history of tremors and nystagmus, there was toward the termination, neither nystagmus nor intention tremors, but the presence of severe bulbar symptoms with bilateral spastic phenomena.

In a résumé of the literature we have been unable to find any case resembling ours both clinically and pathologically, although clinically there were many. The nearest approach is by Catola (10) who reported a case of a man of 38, who after an attack of cholera had tremor in the limbs and head and after some months disturbance of speech, nystagmus, spastic cerebellar gait, left sixth nerve palsy, increase of reflexes and Babinski. At the necropsy there was found an atrophy of the cerebellum and brain stem with multiple plaques of sclerosis, without a secondary degeneration in the cerebellum, pons and medulla, small lesions elsewhere in the brain and a pseudo-system degeneration of the ventro-lateral tracts and especially of the pyramidal. There was also some thickening of the pia and subpial structures and degeneration of the blood vessels. Catola regarded his case as one of disseminated sclerosis associated with cerebellar atrophy, the latter being probably due to vascular disease.

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THE CASE OF ROBERT BACHMAN—A STUDY IN THE PSYCHOLOGY OF RELIGION¹

BY W. W. RICHARDSON, M.D.

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The case of Robert Bachman, the so-called "Devilchaser" of Northampton Co., Pa., presents some points of unusual interest and for that reason is deemed worthy of record.

The father was a man of temperate habits, was active in the Reformed Church at one period of his life, but for the past fifteen years took no interest in the church. He died recently at seventy-four years. The mother exhibits no unusual mental nor religious tendencies and is in good health at seventy years.

The patient is the sixth child in a family of seven. He does not measure up to the mental caliber of his brothers (several of whom have gone to college), though the patient was given the same opportunities. He went to school until 14 years of age and states that he had to study hard for what other pupils learned easily and often copied from others in order to get along in school. When asked how Robert was different from the other brothers, one of them said that he always had too much to say, or "slopped over," to quote the exact expression. He has had hay fever occasionally and gonorrhea at 21 years of age. Syphilis denied. Has used alcohol very sparingly.

Bachman was a farmer until eight years ago, when he became a millwright in the cement mills and rose later to be master mechanic, earning over \$100 per month. Was married at 28 years of age and is now 35 years old. The first child died at nineteen months from pneumonia and seemed normal. The second child was born some five months after his admission to the hospital and is very healthy in appearance.

Bachman was confirmed in the Lutheran Church at 16 years of age, but experienced no religious excitement at this time; was a Sunday-school teacher at 24 years of age and took a rather active interest in church work. Later, however, he at-

¹ Read before the Philadelphia Psychiatric Society, March 11, 1910.

tended less regularly and has gone to church very little in the past few years.

In January, 1908, he was one evening playing cards and drinking a little with friends, when one of them mentioned that a common friend had been converted. Bachman for some reason was interested, and in the morning sought the converted friend. The story was told and Bachman was instructed to read his Bible. He became convinced that he had not been living right, cancelled an engagement to play cards that night and read the Bible with his wife instead (his wife coöperating readily). He now read the Bible whenever he had the time, and finally asked for a leave of absence from work that he might more fully search the Scriptures.

It was during this period that he saw a vision in the sky, of "angels-of-light," whereupon emissaries from the devil, which were darker, came up from below to obscure the angels of light but could not. His wife, sitting near, did not see the vision. He soon began to talk of his new-found religion to his brother-in-law, Mr. Smith, and the latter and wife quickly took up the same ideas. There was now a little group of these worshipers who called themselves by no special name but read the New Testament and made their own interpretations. All of them appear to have been people very much of Bachman's own mental caliber. They met during April, 1908, at Bachman's house, on a Sunday, and held a service, but it is denied by all present that there was manifested any excessive or unusual religious excitement.

Finally on Saturday, April 25, the brother-in-law Smith, his wife and their five-year-old little girl, Irene May Smith, came to spend a few days with the Bachmans. Smith then related how he had had the "second coming of Christ" in his heart that day at home and told how it affected him. On the way over Mrs. Smith had gone through the same experience, so that the husband and child had to get out of the buggy until the ordeal was over. Upon the horse becoming unruly at this time it was attributed to the devils who were leaving Mrs. Smith and entering the animal.

Bachman felt some surprise that the Smiths, who had so recently been converted, should have gotten "farther along"

than he. The Smiths told him it was because he didn't humble himself sufficiently and couldn't wholly give up the world.

The next morning (Sunday), while they were discussing religion, Bachman felt the "second coming of Christ" and retired to his room, where he went through various gestures and movements indicative of the casting out of the devils in him by the Spirit of God. Mrs. Bachman, later in the day, passed through the same experience.

During this time all four had frequent "visions." The one having a vision would suddenly stop talking, become motionless and perhaps place the hands over his eyes. Some visions lasted as long as an hour. During the vision no attention was paid to questions, though the subject was conscious of what was going on about him. The "New Jerusalem," "the second coming of Christ" and various heavenly objects were seen.

Monday afternoon Mr. and Mrs. Smith were "swept and garnished," this consisting in first falling slowly to the floor, lying motionless, then rolling about and kicking the furniture and other objects in the room. Bachman and his wife likewise passed through this experience a few hours later. During all this time meals were very irregular. The Spirit told them when to eat and they assembled without being called.

The child was in and out, but spent most of the time at the neighbors, stating that she was afraid of her father and uncle because of their looks and actions. On Monday afternoon the child came in several times, playfully offering each one in turn leaves, flowers and other trifles. They construed these as temptations from the devil to lure them from their new-found faith and the child was his instrument. Each time she offered anything they beat upon their knees and went through contortions to keep out the devils, at the same time ordering the child out so roughly that she was frightened.

About dark Mr. and Mrs. Smith retired to their room where Bachman found them crying. Smith explained that he cried because he couldn't give up the world and Bachman tried to cheer him. The child now appeared and went over to the bed where her parents lay. Bachman pushed the child roughly away. Again she approached and again he pushed her, this time to the floor. At this juncture the Smiths arose and began smashing the furniture in the room, Bachman encouraging them to go

ahead and thus drive out the devils. Bachman himself now knelt over the prostrate child, taking her neck in his grasp. Once she spoke, mentioning the name of God which only aroused him the more, as he felt that she was wholly possessed of devils which, through her, were using God's name in vain. The others soon left him in the room alone with the child, and he remained in the same position upon the child for hours, during which time the child's death was accomplished. He said afterward that he had no idea of the passage of time, but heard later that it was about two o'clock when the others entered. He heard Smith outside say "this is the devil's work" and he knew from this remark that Smith had gone back and had lost God.

Bachman has stated that, while sitting upon the child, the impulse came to kill her to drive out the devils and send the child to heaven instead of to hell, and thus to save them all from the temptations coming to them through her. While kneeling he was calling upon the devils to leave the child. The impulse to kill came, he felt, from God, though he did not hear God's voice nor see Him.

The next day when arrested he was still having some visions, but his condition soon became calmer. In prison he showed little of his former excitement, and was not specially exalted except when questioned as to his beliefs.

When examined by the writer May 21 (three weeks after the tragedy) he gave the above account with little hesitancy and no display of emotion except a slight exaltation when discussing his religious views. He had no regrets in the whole matter except that the others faltered at the last and did not keep the faith. In regard to his future he was in God's hands. He felt that there could be no turning back and that he must go on. To go back would be to go into torment. His creed was simple and consisted in following the teachings of the New Testament as closely as possible and abjuring the regular churches. One should not wear ornaments as being temptations to a worldly life. His account was perfectly coherent and he at no time showed embarrassment nor inability to express his thought.

It may be said here that Mrs. Bachman and Mr. and Mrs. Smith were kept in prison for a short time and then were allowed to return to their homes. Evidently they were awakened to the true relation of things by Bachman's act, and it is

certain that, whatever vestiges of their former views these three may entertain, they are not now insane and probably suffered only from religious hysteria of epidemic and transient type.

Bachman, having been declared insane by a commission in lunacy, was admitted to the State Hospital for the Insane at Norristown, June 5, 1908.

His condition and attitude of mind remained apparently unchanged for some months and it was not until December, 1908 (six months after admission), that any change in his views could be noted. In two examinations, some days apart, by different observers, it was noted that he showed distinct emotion, even to tremor and at time tearfulness, when speaking of his trouble. Referring to his crime, he said he must have been influenced by a higher power than his own and, if that power was God, as the patient believed it was, then there could be no sin—"but," he added, "if it was the power of the devil, then of course it was a great sin." This is the first admission from him of even the possibility of error on his part. He admitted that he had read the Bible too much at home and had gone into the matter of religion too deeply and that it probably had influenced him the same as too close attention to any subject would have done. He was willing to admit the possibility that he might have been temporarily unbalanced at the time of the murder, though he could not himself see things in that light. He stated that he was under a great nervous strain when visiting his father some days before the crime and knew that he was not altogether himself.

No marked change in his mental attitude has been detected since that time, though some statements recently made indicate further renunciation of his former position. In a conversation held nearly a year after the ones above reported, he stated that he and his wife had lived in a very narrow circle all their lives and that he had never realized how ignorant they were of life and the relations of things until he came to Norristown. He said he had known nothing of insanity nor what insane people were like. Since coming here he had had much opportunity to learn what insanity meant and to compare himself with others whom he knew to be insane. While he still felt that his act was not wrong for the reason that his motives were pure and that he had no evil thoughts against the child, still he tacitly admitted

the probability that he was not mentally sound when he killed the child. At this conversation it was noted also that he was under a considerable emotional strain and that he felt the subject a painful one, thus showing a striking contrast to his early readiness of speech about the matter.

Since his admission to the institution he has been a model patient in every respect, working faithfully and efficiently wherever placed and showing much enjoyment in the day's work, especially when out-of-doors or about machinery, for which he has an aptitude. He is extremely tactful and courteous in all his relations with both patients and officials. He never discusses his troubles with anyone unless questioned and then only with the physicians.

In a careful search of the literature for similar cases I was able to find no case of a precisely analogous character. The following cases, however, show points of resemblance and were reported by Dr. Henry M. Hurd in the Annual Report of the Eastern Michigan Hospital for Insane for the year 1884, Dr. Hurd being at that time superintendent of the Michigan institution.

Two sisters were admitted to the hospital at the same time with the following history: There was a strong neurotic taint in the family including imbecility, epilepsy and alcoholism. The brothers and sisters of the patients were below the average intellectually. The one patient was never bright and had had two attacks of depression prior to this attack. After marriage, and immediately after childbirth, she was in a morbid mental state for five months before the outbreak to be described. The sudden death of a niece, from epilepsy, coupled with the supposed suspicious acts of the patient's husband at the same time, suggested to the ignorant family the probability of witchcraft as the cause of death. The patient, already probably insane, began to experience hallucinations of smell and taste, fancied herself to be suffocating, heard strange sounds; all of which phenomena were attributed to witchcraft.

Soon other members of the family had similar experiences and within a few days all the ten adult members of the household were having precisely the same symptoms. They cut little pieces from the fingers and toes of the first patient in order to keep her blood running, believing that, if the blood stopped, life would

be extinguished through witchcraft. They fired guns through the windows and did many other strange things to keep out the witches. A physician who went to investigate was stabbed, through their fears of harm, and finally the whole family was arrested and a lunacy inquiry followed. The first-named patient and the sister who had done the stabbing were committed to the hospital. As soon as they were removed, the rest of the family dropped their delusions and in a few days were able to return home.

The second sister, who was feeble-minded and superstitious by education, relinquished her delusions in a few weeks and was permitted to return to her home and household duties. The first patient was still under treatment when the report was written, but a year or so later was taken home in an improved condition.

Dr. Hurd concludes his description as follows: "In this instance, all the delusions, which were entertained by other members of the family, were unquestionably derived from the one insane woman. Had she been surrounded by persons of healthy minds and fair education, who possessed the ability to discern the results of disease, it is probable that the insanity of the first sister would not have extended beyond herself."

The similarity between this group of cases and the Bachman case will be readily noted, in each there being the basis of ignorance and superstition and the ready susceptibility to suggestion, leading up finally to acts of violence, with the rapid disappearance of the morbid state in most of those affected.

Although there are numerous accounts in history of outbreaks of epidemic convulsions and other nervous and mental manifestations, usually of religious origin, very few of these accounts mention any actual cases of permanent insanity as having resulted. The elder Edwards (1) has left an account of the nervous disorders which accompanied the revivals of religion in New England from 1735-1742. Many instances are given of fainting, falling, trance, numbness, outcries and convulsions and he relates that some of the subjects "lost their reason."

In a most interesting account of the remarkable epidemic convulsions of religious origin which occurred in Kentucky and reached their height about the year 1800, Yandel (1) states that "notwithstanding the intensity and duration of the nervous dis-

order, no instance is recorded in which permanent insanity resulted."

In a lay account of the great revival of 1859 in Ireland by Archbishop Stopford (2) the writer describes many cases of morbid religious excitement and makes the statement that there were observed twenty cases of positive insanity of a "hysterical kind." The duration of these cases, however, is not stated and whether by modern tests they would be regarded as really insane is problematical.

To understand the crime of Bachman it is necessary to know the environment of the man. It is well known that among the Germans residing in eastern Pennsylvania, especially in certain sections of Lancaster, Berks, Lehigh, Montgomery and Northampton counties, there are numerous small religious sects, many of which hold very peculiar views. No farther away than Reading there is said to be a band of the "Holy Rollers," who, at the height of their religious excitement, roll about on the floor, shouting and singing, until exhausted. Witchcraft and demonology are common beliefs and the "pow-pow" man does a thriving business. To illustrate: the wife of one of my patients, apparently a woman of average intelligence, brought me a piece of cloth which she had had "pow-powed" by a "pow-pow" man, who assured her that if the cloth were laid upon her husband's pillow for a certain number of nights, it would cure his insanity. It is even asserted that in the section of Northampton County where Bachman lived, there are women who, believing themselves to be witches, sell "hoodoos," and that witch-dances are held upon a certain hill in which dances men and women participate, and in which rites very similar to those of the ancient Druids are observed.

With this brief statement of the atmosphere of superstition and religious fanaticism in which Bachman lived, the origin of his beliefs and crime is rendered more comprehensible.

Searching more closely for an explanation of his deed, the ignorance of the man should be given full consideration. When an ignorant man of unstable disposition searches the Scripture for many days he is likely to make too literal interpretations thereof and come to grief. It will be remembered that on the afternoon before the homicide the Smiths and, later, Bachman, had been "swept and garnished" and that earlier they had all

seen the "second coming of Christ," been purified and had forsaken the world. If I may be pardoned, I will here quote verses 43, 44 and 45 from the twelfth chapter of Matthew.

"43. When the unclean spirit is gone out of a man, he walketh through dry places, seeking rest and finding none.

"44. Then he saith, I will return unto my house from whence I came out; and when he is come, he findeth it empty, *swept and garnished*.

"45. Then goeth he and taketh with himself *seven other spirits* more wicked than himself and they enter in and dwell there; and the last state of that man is worse than the first."

Here, then, we see the scriptural foundation for the ceremony of being "swept and garnished" and, furthermore, we find an explanation for the great fear of being pursued by devils which *just at this stage* began to concern them. For the rest of the day they were apparently largely occupied, through their literal interpretation of this passage, in keeping the devils from entering into them, they having been purified and sanctified. The little girl in her innocent play offered them leaves and flowers and from that moment was considered the agent of the devil and was spurned as a contaminated thing.

Beard (3) in his analysis of the factors leading up to the Salem Witchcraft makes the following pertinent statement: "The weaker and more immature the mind, the further it extends its imaginings and the less it heeds what is immediately about us. This law of the *correlation of feebleness of mental force with immensity of imaginings* is universal; the less we know, the more we dream—such is the psychology of witchcraft"—again, "for the undeveloped mind nature is too mean and small a thing; only in the supernatural can there be found proper food for emotions."

A proper interpretation of the term religion will also aid us materially in understanding Bachman's deed. Religion *per se* is a different thing from morality. In the early ages, religious rites were frequently anything but moral and this is seen among savages of the present day. Morality was added as an adjunct to religion as the race developed. Whenever, even in the present day, religion becomes fanatical, it becomes selfish, the moral element may largely disappear and cruelty reigns.

To quote from Ribot (4): "The religious sentiment and the

moral sentiment, though having numerous points of contact and moments of fusion, are yet, in their nature, essentially distinct. Primarily, the religious feeling is a special emotional form, the moral feeling is another form. A mass of facts demonstrate that in the beginning the religious feeling is not only quite a stranger to morality but even in conflict with it. Contemporary criminologists have shown that prostitutes and even ferocious criminals are most assiduous in their devotional pastimes. This is because the religious feeling, in its origin and taken by itself, is fundamentally selfish, being nothing else but anxiety for one's individual salvation. The superposition of the moral sentiment has taken place in all the great religions." These observations throw light upon the apparently wanton cruelty of Bachman's act. His religious exaltation was selfish, cruel, pitiless, he being chiefly intent upon protecting from contamination himself and his companions.

Why, then it may be asked, did not Bachman return to a normal mental attitude if his deed was only the cruel act of a misguided fanatic, performed at the culmination of a religious frenzy? It might naturally be supposed that, after a few days, the excitement having subsided, he would repudiate his act and see its folly. A key to the explanation is to be found in Bachman's own words to the writer when examined about three weeks after the crime. After his description of the crime and when asked as to his future, he said that he regarded himself as clay in the hands of God to be dealt with as God might wish. He felt that there could be no turning back now and that he must go on. To go back *would be to go into torment*. The conserving power of nature here has evidently asserted itself. To fall from the heights of religious exaltation and bliss suddenly into an acute remorse for his terrible deed would have been more than any ordinary mind (much less, Bachman's) could have withstood and the result would have been perhaps a violent acute insanity. In the language of the psychologist, a "defense-reaction" was set up to avoid this mental catastrophe and the intense religious excitement gradually simmered down to a mild exaltation which lasted for many months and finally seems to have largely disappeared after the lapse of nearly two years. This transition was aided no doubt by the suggestions of those in whom he had confidence but was probably more dependent upon

his own observations of the mental derangements of others, his broader contact with people in an entirely new environment and especially through the lapse of time.

It has been asserted that Bachman is a religious paranoiac. To the writer this view is untenable for many reasons. While Bachman was deeply interested in religion he was not the leader in the various manifestations at his home, but followed the lead of Smith and his wife in having "visions," being "swept and garnished," etc. Therefore he cannot be said to have been the paranoic leader of a band of weaker minds.

The rapid onset of the psychosis is certainly opposed to our conception of the classical picture of paranoia with its very gradual development.

Again, there has been absolutely no development of that exaltation and self-importance which we have learned to associate with religious pananoia. On the contrary, during the past year there have been many evidences of increasing insight into his condition and a realization of the awfulness of his deed on the part of the patient. The early exaltation has entirely disappeared.

Whereas, the religious paranoiac is usually ready and anxious to parade his views before the world, Bachman is sensitive and retiring and never mentions his trouble unless questioned. Everything indicates that his interest in his family and the affairs of the institution is such that he rarely thinks of religious matters. While in the beginning he sometimes asked for a Bible he never does so now and seems to have no desire to read it. It seems to me certain, after much study of the case, that there has been absolutely no development of systematized delusions of a paranoiac nature which, if present, should now be more firmly fixed and conspicuous than ever. The history of all such epidemic hysterias or insanities is that they are nearly always transient or at least not permanent. Had Bachman not perpetrated the crime through mistaken religious zeal it seems certain that his mental disturbance would have subsided as rapidly as did that of the others.

Bachman is an anachronism. Had he lived centuries ago when babes were sacrificed in the religious rites of the Druids and others, when morality was not developed and ignorance of all things was widespread, when demonology and witchcraft were

the prevalent beliefs, he would not have been considered insane nor his acts strange.

He lacks poise and, by the testimony of those near him, has evidently always been an extremist. Just as he always had "slopped over" in his talk, so here he "slopped over" in his deed—and committed crime.

As to the proper pigeon-hole in the classification for such a case as this it is not easy to decide, but in view of the epidemic nature of the whole manifestation, the absence of delusions at present and the tendency toward recovery of a normal mental tone, a diagnosis of hysterical insanity of the epidemic type seems the only one justifiable.²

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² Since writing this paper my attention has been called by Dr. A. R. Moulton to a case which is identical in many respects with the one here reported (see "Case of Chas. F. Freeman, of Pocasset, Mass.," by C. F. Folsom, M.D., *American Journal of Insanity*, Vol. 40, p. 353). This man, an Adventist, after months of religious contemplation, killed his little child in the belief that the Lord had commanded him, as he commanded Abraham, to sacrifice his beloved child. The next day he announced to his fellow Adventists that the child was to arise on the third day. His wife also became imbued with these beliefs. He was arrested, indicted, but upon testimony as to his insanity, was sent to the Danvers Hospital for treatment. Three years later application was made for a trial, much medical testimony being introduced to show that the man had recovered. He was tried and was declared "not guilty by reason of insanity." According to the Massachusetts law of that time, he was sentenced to the Danvers Hospital for life, although admitted to be entirely sane. Some four years later he was released upon a governor's pardon. I am informed that he then went to a distant city, changed his name and prospered in business. He never had a return of his mental disorder.

Society Proceedings

NEW YORK PSYCHIATRICAL SOCIETY

NOVEMBER 3, 1909

The Vice-President, DR. HIRSCH, in the Chair

THE CURE OF PRE-PARETIC STATES

By C. L. Dana, M.D.

A report was given of the later history of seven cases, which Dr. Dana had presented to the society in 1905. Of the seven cases, five had continued well; one had developed melancholia and killed himself; the other had had a renewal of his primary symptoms and died from true paresis, after a remission of complete health, lasting for seven years.

Dr. Dana reported four other cases, in which the patients had shown distinct symptoms of paresis, but which had all recovered and remained well for several years.

His conclusions were that paresis was simply another phase in the life history of syphilis, and that there was no reason why it should not be arrested by proper treatment in the earlier stages, just as occurs in locomotor ataxia.

He thought that symptoms of true paresis often appear long before the characteristic lesions of the cerebral cortex occur, and cited a case in illustration in which a patient had developed noticeable changes in mentality five years before any organic symptoms appeared.

Dr. Meyer said it would be very desirable at the outset of the discussion of such an important topic to eliminate any unwarranted contrasts between neurologists and alienists, and the time when the one or the other would be able to make his diagnosis of general paralysis. The present conceptions of general paralysis held by most men are identical with those held by men like Krafft-Ebing and Oppenheim whose qualifications as neurologists as well as alienists stand above question. There is no doubt about the recurrence of far-reaching remissions in general paralysis, but also no doubt about the difficulty of definition of what should pass as general paralysis. We know with what hesitancy we approach at the present time the differential diagnosis of syphilitic vascular lesions and of various diffuse or more localized syphilitic processes, and how reluctant we must be in many cases about making a diagnosis of general paralysis. The only safe and final discrimination to-day is the anatomical differentiation. He remembered most clearly a case of tabes at the Worcester Insane Hospital, committed on account of incompatibility and flighty business ventures, for years a slightly hypochondriacal but capable worker at the institution, retained on account of epileptic attacks, and finally a decline within a few months with marked tremor, difficulty of speech, but always remarkably good insight. The autopsy showed only tabes, no cerebral infiltrations

of the general paralysis type. In all honesty we have to define this as a condition which we have no right to specify as general paralysis and which we are forced to designate as a condition of uncertain character.

In none of the cases that Dr. Dana has specified did Dr. Meyer find those symptoms which he would demand for a diagnosis of general paralysis in his hospital service. Most of them are undoubtedly cases in which he would have felt that we had no right to certainty and in which we would have to give nature and the patient the benefit of the doubt. We have, however, to-day methods of differentiation which should be made available. He only referred to the differences established between the Wassermann reaction of the blood serum and that of the cerebrospinal fluid. Where we do not get the reaction with the cerebrospinal fluid, but only with the serum, we have reasons to think of cerebral syphilis only.

In regard to the depressions and neurasthenic states, Dr. Meyer should be extremely guarded even in the presence of pleocytosis unless he should find discrepancies of judgment, even of a slight character, speech and writing disorder, tremor and reflex anomalies. With all these strictures, he nevertheless would want to express his appreciation of Dr. Dana's bringing this type of cases to discussion. We have to face them for action; whether Dr. Dana calls them pre-paretic states or Dr. Meyer preferred the term pre-diagnostic states, is a difference in nomenclature and in definition.

Dr. Carlos F. MacDonald said Dr. Dana is certainly to be commended for his optimism and for the very careful study he has made of the subject, as well as for his able presentation of it; and while Dr. MacDonald is not yet prepared to accept his view of the matter, he must say that if Dr. Dana succeeds in establishing it to the satisfaction of alienists generally, he will have made a very great step in advance in respect of our knowledge of this most formidable, most fatal and, heretofore, most hopeless of all forms of mental disease—a form of mental disorder from which there has never been an authenticated recovery.

It seems to Dr. MacDonald the whole matter hinges upon the question of diagnosis, and he confessed that it is difficult for him to realize how we can determine in a given case that it is true paresis so far in advance of the onset of the disease; that is, before there are any appreciable symptoms by which we can recognize it, or at the period which Dr. Dana characterizes as the "pre-paretic state." In other words, in cases where we may suspect the approach of paresis he failed to see how a diagnosis can be made before the disease has developed to an appreciable degree, or, if a provisional diagnosis be made, and there are no further developments, how are we to determine definitely that the case was one of true paresis or that it would have developed into that disease had no preventive measures been adopted. Alienists have long been accustomed to look upon true paresis, when the diagnosis is definitely established, as an absolutely hopeless form of disease, as regards recovery. We have also frequently observed in these cases remissions covering long periods of time, and it has occasionally occurred that such cases have been pronounced recovered, but experience has shown that they never fully recover, but that, eventually, they invariably relapse, even though they may have remained apparently well for months, or even years; so well, in fact, that they are able to live at home, under ordinary circumstances, but rarely are they able to fully resume their former relations in life, especially in a business or other capacity which involves mental strain. He recalled a case of a man, prominent in public life, which occurred early in his experience as an alienist,

in which he made a diagnosis of paresis, having found the characteristic mental and motor symptoms of the disease. He announced his diagnosis to the family and also, unfortunately, gave a positively unfavorable prognosis. Within a period of less than a year a remission occurred which lasted altogether about seven years. The friends of the patient regarded him as recovered and felt that Dr. MacDonald had made a mistake in diagnosis and, of course, in prognosis. The patient eventually relapsed and died of paresis. At that time it seemed a very exceptional case, but later experience and the observation of a large number of cases have led him to take a different view of it and he now knows that cases in which the remission is prolonged to a period of many months, or even years, are not infrequent. But these cases never fully recover. On the contrary, they invariably relapse and terminate fatally unless sooner carried off by some undercurrent disease or by an accident. We, of course, all see cases of pseudo-paresis, either of the alcoholic or luetic variety, which resemble true paresis so closely, for a time at least, that it is difficult to differentiate them from the latter disease. A certain proportion of these cases yield to treatment and make a perfect recovery, the outcome of the case oftentimes determining the diagnosis; so that, where cases of paresis are said to have been arrested or to have terminated in recovery he had regarded them as instances of mistaken diagnosis; that is, that they were either cases of pseudo-paresis or some condition other than true paresis, for he has a pretty firm conviction that no case of true paresis ever recovers.

The cases cited by Dr. Dana are certainly interesting, and the subject as presented by him is well worthy of being followed up, and it would be well if it could be established to the satisfaction of alienists that there is a "pre-paretic" stage in which the disease is recognizable and that such cases can be arrested or cured. But, as before remarked, the difficulty lies in our inability to recognize the disease before the development of any of its characteristic symptoms and to determine that it is a case of true paresis while it is yet in what Dr. Dana designates the "pre-paretic" stage.

As regards the statistics of institutions for the insane, many of them are of very little value, especially those respecting the etiology of insanity.

Dr. Campbell said he felt it a little difficult to discuss the subject of the paper without at times using words which perhaps beg the question, but he thought that in discussing this question of general paralysis in the incipient stages, one has first of all to be somewhat clear as to what one means by general paralysis. If one uses the term pre-paretic, without having shown what general paralysis means, we shall be talking at cross purposes. It is not only in the initial stages of this disorder that difficulty arises; even in the very advanced stages there are cases where one has difficulty with the diagnosis.

If one start from Alzheimer's point of view, one is on fairly solid ground; he separated a large number of cases which were clear clinically, and found in all these cases that there was a uniform anatomical finding. Therefore, in the typical cases of general paralysis which come to autopsy one expects to find anatomical changes. If in one hundred and seventy clear cases one has always found this anatomical picture, what is one going to do when in doubtful clinical cases one does not find this picture? Are we still entitled to call it general paralysis, owing to the nature of the clinical picture, or is it not better to hold the case simply in suspense unless the anatomical finding shows that the case obviously belongs to some other clinical group? If there are a certain number of cases which

go as far as autopsy, but yield anatomical findings upon which we still cannot make a diagnosis, and where the case rests in suspense, upon what ground are we to accept these cases clinically doubtful, where we have no confirmation of diagnosis by anatomical examination, to call these cases pre-paretic and to assume them to belong to the same disease, to general paralysis? To do so is to a certain extent to beg the question. If one takes the anatomical findings in general paralysis, there are in the picture the two elements, the degenerative and the inflammatory changes, and in each of these one finds variations in the different cases. In some cases the details of the picture remind us of what is found in certain cases of brain syphilis where there has not been a question of general paralysis. Therefore, even in fairly uncomplicated cases of general paralysis, the microscopical examination may point to elements in the picture itself which suggest that besides the ordinary changes of general paralysis, there is a secondary element present, or at least the whole process may be found on analysis to consist of two processes.

The earmarks which Alzheimer found always present in one hundred and seventy cases, we are entitled to use in our judgment of doubtful cases. In doubtful cases of general paralysis which come to autopsy, we often find in addition to the changes of general paralysis factors present, such as processes depending upon what we are accustomed to call definite syphilitic changes, such as Heubner's endarteritis. Therefore, one may find in cases of general paralysis syphilitic changes simultaneously present; and in that element of the anatomical picture which is termed the general paralytic element, there is frequently evidence which suggests that the process is a complicated one. Clinically we find that a patient may have had a variety of neurological incidents preceding by a very long time the development of what we consider the clinical picture of general paralysis, and at autopsy we may find that there is evidence of syphilitic changes besides the process of general paralysis. The whole clinical course, therefore, must not be looked upon simply as the progression of a unitary disease, but as a rather complicated history. Different cases may run a very similar course, but the outcome may be different, because the process of only one disease has been there, and there has been no development of the specific general paralytic process. The close similarity of the earlier stages of such divergent cases does not enable us to conclude that they should be put in the same category.

With regard to the question of the duration of the disorder, and of the value of institution statistics, Dr. Campbell did not exactly see why institution statistics should be disqualified, because after all they are the only complete statistics; the duration of the disease until death can only be determined after the day of death. Institution statistics used in the cases in which anamneses are complete are as a rule the most reliable statistics on which to estimate the duration of the disease.

Dr. Dana said he did not mean to speak disrespectfully of institutional statistics. He was speaking of this single group of very carefully worked out statistics by Dr. Green which appeared in the *Journal of Mental Science*. He is a physician in one of the Scotch asylums and these were statistics from an asylum. He published a table showing that in the young and in tabetic cases and in women, the duration of paresis is four or five years. In other cases it is shorter. Dr. Dana only meant that that kind of statistics should be supplemented by others, as Dr. Diefendorf has himself suggested.

He has much the same point of view with regard to cerebral syphilis as Dr. Hirsch. He has a conviction that we will reach a conclusion finally that cerebral syphilis is always a potential paresis and that cerebral syphilis and paresis are not very fundamentally different.

JANUARY 5, 1910

The President, DR. WILLIAM MABON, in the Chair

THE ALLEGED INCREASE OF INSANITY

By H. R. Stedman, M.D.

In a paper on this subject Dr. Stedman showed the loose and unwarranted conclusions which have led to the popular belief that insanity is increasing and emphasized the vital importance of utilizing exclusively the number of freshly occurring cases and comparing them with the size of the population at different periods in any attempt to ascertain whether or not a disease is on the increase. The most careful research by competent investigators from data at present available shows *no increase in insanity* above that which is due to the natural growth of the population.

Dr. Russell believed that Dr. Stedman was correct in saying that the data on which to form an opinion on this subject are very incomplete. The speaker endorsed what he has said, at least to the extent of saying that we are hardly justified in taking very strong ground that there has been a real increase in insanity.

We are trying to improve our methods of collecting data in this state and hope in time to be able to furnish better information than we can now.

The importance of the subject to the lay mind must be very great, for there is hardly any question asked more frequently, and the public has a right to expect a conclusive answer. It is very difficult to compare the statistics in one place with those of another. In the last report of the State Commission in Lunacy in this state, there is a comparison between New York and England. One point brought out in regard to first admissions in this study is that in this state the cases admitted for the first time to a state hospital have much less frequently had previous attacks than in the cases of English admissions. In the case of those admitted to English hospitals for the first time, there is more frequently a history of previous attacks for which they were not admitted.

Another study that might be referred to was one made by Dr. Salmon some time ago. It was an article he read at the State Conference of Charities. In this he showed that the increase in the insane in institutions in this state pertained only to foreign-born residents of the state. For the native population the increase in the number of the insane in the institutions corresponded almost exactly to the increase in the native-born population. With the foreign-born it is quite different. The proportion of foreign-born in the institutions is almost double the proportion of foreign-born in the population.

There are some facts which would indicate the increase of insanity; one is the increase of suicide. We know that quite a large proportion of suicides have some morbid mental condition and that insanity and the prevalence of suicide may be said to go hand in hand.

Neurologists find, also, there is quite an increase in the prevalence of neurasthenia and psychasthenia. Dr. Clouston in one of his reports, perhaps six or seven years ago, gave a study of Scotland in which he came to the conclusion that the alcoholic insanities and the insanity of adolescence had actually increased in Scotland.

Dr. Knapp said there was one point which Dr. Stedman has only indicated as one of the things which lead to greater resort to the hospitals, and that is the great increase in urban life, which in general renders it far less feasible to care for the mildly insane in the home than it would be in rural life in the good old days when there was nothing more dangerous going by than possibly an irate cow. The demented person could be cared for at home, whereas now he could not be depended upon to look out for the automobile and trolley car.

As a matter of personal experience, the statistics at the City Hospital in Boston, while showing a very great increase in the number of patients, both in the wards and as out patients for the last twenty-five years, yet they do not show as great an increase in the department for nervous diseases as in the other departments. The number of cases received there each year, although showing some increase in twenty-five years, with the enlargement of the hospital and the enlargement of the various departments, at the same time does not show a relative increase which can be at all compared with the increase in the surgical clinic, for example. Some years ago, Krafft-Elbing, in a very elaborate study, seemed to think that in Vienna there had been actually an increase, beyond the increase in population, in general paresis. We recognize general paralysis much more readily to-day, of course, than we did twenty-five or thirty years ago, but the speaker felt that he had not seen any noteworthy increase in cases of general paresis in the percentage as compared with that of twenty-five years ago. The whole question, however, is obscured by the fact that we are dealing a good deal more with generalities for a good many different diseases, dependent upon a good many different causes, and we can draw definite deductions only when we consider the diseases individually, studying, not insanity as a group, but paresis, dementia præcox, paranoia; we get furthermore our data in regard to the occurrence of cases from the mere fact whether they are sent to the hospital or not. The physician is obliged to report his cases of diphtheria and typhoid and tuberculosis and we know whether these diseases are increasing, and it is only when we can get the actual occurrences in the community of all the cases of paresis, of all the cases of paranoia, that we can get really any satisfactory deductions.

Dr. Stedman, in closing the discussion, said that he had made use of English lunacy statistics chiefly, because they have long been tabulated with a special reference to that important problem and because the population of Great Britain is exposed far less than any of our states to irregular fluctuations in its size and character and is particularly more stable as regards immigration. The Massachusetts Board of Insanity has published a table of new cases entitled "First Admissions to any Hospital," for many years and the New York Commission in Lunacy has recently adopted the practice. We may hope, therefore, for more reliable data on this important question from these representative states.

Periscope

Allgemeine Zeitschrift für Psychiatrie

(LXVI. Heft 5. 1909)

1. Contribution to the Clinical History and Pathology of the Acute Fatally Ending Psychoses. THOMA
2. Disturbances of the Carbohydrate Metabolism in Insanity. A. KNAUER.
3. The Somatic Symptoms in Dementia Præcox. THOMASCHNY and MEYER.

1. *Acute, Fatally Ending Psychoses.*—Under the name of delirium acutum, a number of acute conditions characterized by incoherence, confusion, hallucinations, jactitation, and more or less deep clouding of consciousness have been brought together. These conditions are usually combined with severe disturbance of metabolism, elevation of temperature and often terminate fatally under symptoms of exhaustion.

That this train of symptoms may occur in the course of diverse psychoses has been amply shown by cases reported from various sources. The author gives the clinical histories and the pathological findings in seven cases of this character which were observed at Illeau during two years. He was careful to select only those cases which presented the classical symptoms and to rule out cases in which a definite infectious processes was present. In the foreground of the clinical picture in all the cases stood disorientation, incoherence and greater or less clouding of consciousness. The emotional tone was not constant, but anxiety preponderated. Hallucinations were not always observed, motor anomalies like waxy rigidity, automatism and negativism were absent. A motor "chorea-like" unrest was present in nearly all cases. Fever was observed in four of them. Classed according to the clinical symptoms, one case belonged to the senile psychoses, the others could not be certainly placed. The pathological findings in the nervous system consisted in degenerations of the ganglion cells, changes in the fibrils, increase of neuroglia and some fibre degeneration. One of the cases presented lesions characteristic of general paresis. He sums up his results as follows:

(1) No single disease process lies at the basis of the symptom-complex described. (2) One common histological cause for the symptomatologically similar course is not recognizable. (3) Considering the lack of histologically recognizable changes on the one hand and certain gross changes on the other (swelling, alteration of the consistency of the brain), it does not seem unlikely that rapidly occurring physical changes in the brain matter are the causes of the rapidly fatal result. (4) Since in the cases described hereditary predisposition often was present it seems justifiable to conclude that in these acute fatal cases predisposition plays an important rôle.

2. *Carbohydrate Metabolism in Insanity.*—Struck by the frequency with which small amounts of sugar were found in the routine examination

of the urine of insane patients, especially those in the phase of depression, the authors were led to carry out an extended series of investigations during which they made about 2,500 urinary analyses upon the urine of 150 patients. These investigations they publish in an article of considerable length, into the details of which it is impossible to enter here. They freely acknowledge that owing to difficulties inherent upon the condition of insane persons, such as impossibility of always securing the total quantity of the day's urine and of having the patients ingest a fixed quantity of food, besides having to depend upon attendants more or less unsympathetic with the purposes of this work, their results can have a relative value only. This value is however by no means inconsiderable and as an illustration of methods employed, etc., their paper is worth careful perusal by those interested specially in the subject. Out of a number of tables prepared they select three as illustrating, not only the manner of carrying out the research, but also as a sample of results obtained.

The two points which stand out chiefly are, first the frequency with which small amounts of sugar are present if searched for by the more delicate chemical methods, and second their almost unvarying coincidence with conditions of depression in one or another psychosis. Their work is confined to the determination of the presence in the urine of sugars, their amount, their variety and their relation to the carbohydrate ingested.

3. *Somatic Symptoms in Dementia Præcox*.—In this "referat," prepared for presentation at a meeting of the Northeast German Psychiatric Society, the subjective symptoms are considered by Dr. Tomaschny, the objective symptoms by Professor Meyer. In his part of the paper Tomaschny lays chief stress upon such subjective disturbances as may be considered to have an intimate connection with the psychosis itself and which are found with relative frequency. As a basis for his discussion he utilizes his own findings in 150 cases of dementia præcox, together with the results communicated to him by Meyer as obtained from the examination of 238 cases. Headache first occupies his attention. He considers the seat and the character of the pain, together with other sensations in the head which, though complained of, are not represented as directly painful. As an anatomical basis for these pains and sensations, he thinks three different processes are to be considered. Many of them are probably due to neuralgias or paresthesiæ of the nerves of the scalp. In others alterations in the meninges, chiefly in the blood supply or temporary edemas are probably the causative factor, while in still others destructive processes in the brain cortex, occurring as a part of the disease itself, are to be incriminated. Vertigo is a symptom much complained of. While this has been attributed to hallucinations in the vestibular nerve and to disturbances in the innervation of the eye muscles, the author thinks that in the majority of instances sudden alterations in the blood supply of the brain are at fault. "Seizures" were observed in 37 cases. In their lightest forms these resembled fainting attacks, sometimes they were like hysterical attacks, with deep hurried breathing, and tonic spasm apparently without loss of consciousness. In the severest forms there was deep disturbance of consciousness, with short clonic spasm and frothing at the mouth. In the early stages of the disease before the development of the characteristic mental symptoms patients who present these attacks are often considered as epileptics. In one katatonic, attacks of temporary aphasia were repeatedly observed. Difficulties having their origin in the spinal cord were only

observed three times and consisted of paresthetic sensations. Abnormal sensations in the territory of the peripheral nerves were, on the contrary, observed twenty-eight times. These were manifested as sticking, tickling, numbness and tingling and often were compared to the effect of an electric current. Veritable pain sensations, generally with vasomotor disturbances, were also occasionally observed. Subjective disturbances in the region of the heart, but without any objectively recognizable heart or arterial disease, were found in about one quarter of all the cases. Sensations of anguish, apart from those due to fallacious perceptions or to hallucinations, but usually with unpleasant sensations in the heart region, were met with seven times. They resembled closely similar attacks occurring in heart disease. Disturbances arising apparently from the digestive tract were found in thirty-four cases. The patients complained of a disagreeable taste in the mouth, burning, eructations and abnormal sensations about the stomach, as heat, cold, rawness of the stomach, stomach cramps, a sensation as if the stomach was being "pumped out," etc. A periodicity in these attacks was sometimes observed and one patient himself remarked that each onset of a period of disturbance was preceded by sensations of nausea and uneasiness about the stomach. Gastric disturbances, it was noticed, were apt to occur with unusual severity about the time of onset of the psychical disturbance and several patients had entered a general hospital to be treated for gastritis before the symptoms of the psychosis were clear. Constipation and sensation of distension of the abdomen are very frequent and may serve as a starting point for certain delusional ideas in women, for instance, that pregnancy exists. As a basis for the abnormal sensations, while dietetic errors may to some extent play a rôle, the chief cause is probably to be found in disturbance of secretion and innervation. That such disturbances actually occur has been shown by Ziehen and others.

Persistent, and at times periodical vomiting has been observed in a number of patients, especially in katatonics. For this no local cause could be found; it was uninfluenced by treatment, but usually subsided, after a while, by itself. The author suggests that this may possibly be a manifestation of negativism, but has never been able to find that the vomiting was excited by subjective sensations. In a patient who complained of a sensation of having his tongue seized by some apparatus and pulled out, the author suggests that there may have been some disturbance in the innervation of the hypoglossus whereby one or more of the branches was separately innervated for a second or two at a time. Sensations about the genital organs are varied and numerous. These are partly due to a false interpretation of normal sexual stimuli, nightly erections, emissions, etc., partly to false interpretation of paresthesiæ of the genital nerves, but this does not satisfactorily explain why the sexual element plays such a rôle in the conceptual and emotional life of insane patients. Especially remarkable is tendency to continued and persistent masturbation in precocious dementes. This the author thinks must be brought into relationship with some special irritation in the region of the genital organs which is a part of the disease and refers in this connection to Kraepelin's theory which seeks to bring dementia præcox into connection with some intoxication arising from faulty functioning of the genital glands.

Abnormal sensations in the skin may be attributed to paresthesiæ in the skin nerves or perhaps to variations in circulation or to fleeting local edemas, which latter are sometimes noticed in dementia præcox. Paresthesiæ in the muscles may perhaps be at the bottom of delusions of altered

size and weight, etc. Some subjective sensations may be due to altered glandular activity of whose occurrence we have abundant evidence. Conditions of inhibition do not seem to pass away without leaving any trace upon the sensory sphere. After them patients sometimes explain that they were hypnotized, in a trance, etc. Krafft-Ebing thought that the delusion of being dead was sometimes dependent upon the presence of general anesthesia. Complaints of prostration and general weakness are quite frequent and patients who are recovering often have the feeling that they have just passed through a severe illness. Probably if we could always get replies from our patients the number of subjective sensations might be still further increased. They are most marked at the beginning of the disease, fading out later. Familiarity with those usual may be of value to us, in determining the time of onset of the disease, in its differentiation from other psychoses, in finding a material basis for the delusions present and in explaining some of the motor manifestations—possibly stereotypy, etc. For prognosis also they may have an importance in that, if we can bring subjective sensations into relationship with pathological changes, where these symptoms are numerous and persistent, we would have a right to assume that the underlying physical process was diffuse and severe, and that the prognosis was correspondingly unfavorable. It has been shown that cases of katatonia with slow onset and persistent hallucinations affecting general sensation—as of being subjected to electricity, of hypnotic influence, etc.—are among the most unfavorable. Discussing the relation of subjective disturbances to the basis of dementia præcox, the author thinks that they fall in perfectly with the idea that it is a disease due to autointoxication and may be readily dependent upon the organic changes which are the basis of this disease.

Of the objectively recognizable symptoms of dementia præcox considered by Meyer, the changes of the pupils are the most interesting. He lays great stress upon the discovery by Bumke, that the dilatation of the pupil which occurs normally upon sensory irritation and upon any lively psychical stimulus, and the pupillary unrest which is an expression of the constant change in intensity in psychical excitement, are wanting in two thirds of the cases of dementia præcox. Inequality in size of the two pupils and slow reaction to light was observed in a considerable number of cases, although the latter was not always constant. Irregularity of the pupil was also seen in some cases. Exaggerated knee jerk is in general to be regarded only as indicating increased irritability of the nervous system. The author found this increase in 45 per cent. of his cases of dementia præcox. The same remarks apply also to the Achilles reflex. Diminution of the reflexes, on the other hand, was only rarely observed. The author thinks that spasmodic phenomena are perhaps more frequent than is generally supposed, though on account of the muscular conditions which often characterize the disease it is difficult to correctly estimate this. Hypotonia was observed in one case only. Slight differences in the facial innervation were often observed, eye muscle paralysis never, nystagmus occasionally. Speech was in a few cases defective. Choreiform movements are not so rare. In one case there was difficulty in deciding upon a diagnosis between dementia præcox and chorea. In a number of cases, while the tendon reflexes were lively or exaggerated, the reflexes from the mucous membranes were faint or not to be obtained. It will be recalled that a similar condition of affairs exists in hysteria. If searched for, the so-called hysterical stigmata are not so seldom found in dementia

præcox. The author found in his later cases—in which these symptoms were specifically sought for—ovarian tenderness (“ovarie”) in at least one fifth of the women, mastodynia in a somewhat smaller proportion of cases. In some of these the stereotyped movements and attitudes were cut short or altered by ovarian pressure. Mechanical muscle irritability and dermographism are extremely frequent in dementia præcox. Disturbances of the pulse rhythm and its quickening are common enough, and sometimes permanent tachycardia without discoverable heart lesion is encountered. Cyanosis of the extremities is a familiar but often neglected symptom. Increased salivary secretion was observed several times, excessive sweating four times. Trophic disturbances were only met with in one somewhat dubious case of peculiar vesicles on one hand. An enlarged thyroid was found in five cases, twice with tachycardia, but without other symptoms of Basedow’s disease. Once there was exophthalmus without struma or tachycardia.

In closing, the author remarks that the symptoms observed by him do not show any preponderance of the definite signs of organic brain disease, while on the other hand the points of contact between dementia præcox and hysteria are neither well determined nor definite, notwithstanding that many of the signs of nervosity are common to both diseases and some hysterical stigmata—so-called—are observed in dementia præcox. In general, the disease process in dementia præcox seems to involve the nerve elements themselves directly, and not primarily the non-nervous elements as in general paresis. This would explain the middle position of dementia præcox between functional and organic psychoses.

C. L. ALLEN (Los Angeles).

Nouvelle Iconographie de la Salpêtrière

(Vol. 22. 1909. No. 3)

1. Alterations of the Bones in Myopathy. P. MERLE and RAVLOT-LAPOINTE.
2. Generalized Myopathy with Pseudohypertrophy and Atrophy and Hypertrophy of the Heart. VIRES and ANGLADA.
3. Osteitis Deformans of Paget. B. PESCAROLO and M. BERTOLOTTI.
4. Dupuytren’s Disease. W. ROUDNEW.
5. Variety of Acquired Trophedema in Ovariectomized Goitrous and Insane Women. J. RAMADIER and L. MARCHAND.
6. Surgical Intervention in a Case of Hysterical Brachial Psychalgia, pretended Cervical Rib. A. STCHERBAK.
7. Study of Professional Cramps. M. DE LÉPINAY.

1. *Bones in Myopathy*.—The authors made radiographic studies of the bones in seven cases of myopathy, most of them of long standing. They found quite striking changes, the general character of which they summarize as follows: (1) The osseous tissue undergoes modifications in quantity (thinning) and in quality (decreased density, increased transparency). (2) The bones undergo alterations in form. The changes of the first sort affect both the compact and the cancellous tissue. The changes in the compact tissue though less manifest than those of the cancellous tissue are nevertheless constant and give a characteristic picture in the radiograph. The diaphyses are thinned and very transparent in the axial part of the bone, the image resembling that of a thin glass tube. The epiphyses, still lighter, seem formed of homogeneous tissue in which

the trabeculae and reinforcements, seen normally, are no longer visible. The compact tissue around the contour of the bone is reduced to a thin pellicle giving a characteristic flat appearance in the picture. The compact tissue may disappear entirely from the patella in relation to the atrophied quadriceps. The fragility of the bones gives rise to frequent fracture which may be unperceived by the patient. The thinning of the diaphyses compared to the epiphyses is often quite characteristic. Abnormal curvature of the humerus is frequent. There is frequent disappearance of the bony prominences and apophyses for muscular insertion. The contours of the epiphyses are often rounded as if polished off or plunged into a corrosive liquid. A tibial deformity is also frequent. The alterations are more prominent the longer the disease has existed. The two elements of the motor apparatus seem both affected, and it would seem just to speak not only of a progressive myopathy but more justly of an "osteomyopathy." The bony changes are illustrated in some good plates.

2. *Generalized Myopathy. Hypertrophy of the Heart.*—Study of the case of a male of sixteen years in whom the disease had begun nearly ten years before and who had been in the hospital service of Prof. Vires for five years. Beginning in the legs, the myopathy had gradually extended until nearly all the muscles of the body except those of the abdomen were affected. There was cardiac hypertrophy and in the legs pseudo-hypertrophy. A pulmonary tuberculosis suspected at the start had become much accentuated and cavity formation had begun. In this one individual there were represented the pseudo-hypertrophic paralysis of Duchenne, the type of Erb and that of Landouzy-Dejerine, besides atrophy of a number of other muscles not usually attached to any special type. The case is of importance as supporting the idea of the essential unity of the different types of myopathy.

3. *Osteitis Deformans.*—While osteitis deformans is not a new disease careful case reports are not so frequent in the literature, especially in Italy. The authors hence publish a careful study of an instance of this disease which has recently been under their observation, with radiographic pictures of the bones. A man 53 years of age without venereal or alcoholic history, but with rheumatic and gouty heredity, presented the following deformities of the bones which had gradually been coming on during a period of fifteen years. Deformity and enlargement of the cranium; deviation and wasting of the lower jaw with loss of teeth; deviation of the nasal bones; deformity and considerable incurvation of the spine; deformity of the thorax, with flattening of the ribs and hypertrophy of the clavicles, the scapulae and the sternum, without definite hyperostoses; alteration of the pelvic bones with flattening of the antero-posterior diameter; deformity and incurvation of the bones of the lower extremities, notably of the tibia, with considerable diminution in height; changes in the articulations of the smaller phalanges of the hands. To the bony changes were added: (1) Cardiac disease with dilatation, (2) arterial hypotension with tortuousness of the surface arteries, particularly in the temporal region, (3) diminution of the quantity of earthy phosphates eliminated in the urine.

The authors find noteworthy in this case: (1) The slow onset, (2) the beginning of the disease in the small articulations of the hands and feet, (3) the preponderance of the deformities upon the left side, (4) the troubles of the heart and arteries. While upon auscultation mitral and pulmonary murmurs are heard, radioscopy shows an enlargement of the

aorta and the surface arteries are tortuous, the blood pressure was never found over 125 mm. (R.R.), and the arteries feel normal to palpation. They think that this case lends some support to the idea of a connection between Paget's disease and chronic rheumatism.

4. *Dupuytren's Disease*.—Discussion of the possible etiology of contractures affecting both ring fingers in an insane patient 58 years old. His father had had a similar contracture as a result of a trauma and the author considers the question of hereditary influence but fails to trace a connection between the two cases.

5. *Acquired Trophedema*.—Under the name of "Trophedema" Meige has described a "Chronic edema, white, painless, of segmentary distribution, affecting especially the lower extremities, isolated, familial or hereditary, sometimes perhaps congenital." Since then a number of cases, not all having the same character, have been published. To these the authors add the following: A woman 56 years old, who in consequence of severe metrorrhagia had first had a fibroid removed, with later ablation of the uterus and adnexa, within a short time developed mental alienation, a goitre and trophic alterations of the skin, hair and teeth with edema of the lower extremities. After a few months the goitre had disappeared, but the mental troubles persisted and the edema of the lower limbs had attained enormous proportions. The mental trouble was of melancholic type with ideas of persecution, hallucinations of hearing and extreme asthenia. The trophic troubles presented by the patient considerably resemble those seen in dysthyroidism. The smooth and glistening skin of the hands, the longitudinal furrowing and brittleness of the nails, the dental lesions, the falling of the hair, the edema of the lower extremities which at the start recalled the pseudo-edema described by Dide in catatonics, and which actually resembles elephantiasis, are equally signs which could be attributed to interference with the function of the thyroids. The abolition of the internal secretion of the ovaries however in the author's opinion can equally play a role in the production of the trophic changes. The chief interest in the case however lies in the character of the edema of the lower extremities, which it is impossible to attach to any definite nosographic type. The skin of the edematous regions is rose colored and not pale as in trophedema; the edema is of segmentary distribution at the level of the toes and of the feet, but in the lower part of the leg the infiltration is general and increases in intensity from above down. The skin and the subcutaneous tissue are distended by fluid which tends to gravitate toward the lower parts. While trophedema is hard and not depressible, the edema in this case is gelatinous, the feeling is as if the hypertrophied skin rested upon a softer layer. The patient complains of pain in her legs and groans when the least pressure is made upon the skin of these parts. Trophedema is painless. This observation establishes the existence of varieties of edema differing markedly in character from the type described by Meige. It must be concluded that there exists a whole class of dystrophic affections of which myxedema and the trophedema of Meige form the most striking examples. Between these two varieties there are a whole series of intermediary forms differing more or less both in clinical characters and in pathogeny.

6. *Hysterical Brachial Psychalgia, pretended Cervical Rib*.—Case of a woman of 25 years, known to have for a long time presented symptoms of hysteria, who after an attack of typhoid fever commenced to complain of severe pain in the right upper extremity with loss of power and atrophy

of the small muscles of the hand. The pain continuing apparently unabated for eighteen months, an operation for the resection of a supposed cervical rib was performed and some bone supposed to be the offending structure was removed. The patient recovered from the pain after some time, but in two months it returned as bad as ever. The author who had been consulted before the operation and who had advised against having it done, as he was convinced of the hysterical nature of the pain and could find in the radiograph no indications of a cervical rib, was again appealed to and reexamining the patient and the picture made the same diagnosis as before. He found that while the patient complained bitterly of pain exaggerated by the slightest movement, when her attention was distracted, quite extensive excursions of the limb could be made passively, without complaint of pain. There were some islets of anesthesia upon the right side, insensibility of the cornea and concentric narrowing of the visual field. While the patient had evidently had a slight neuritis following the typhoid fever he is convinced that the pain was of psychical origin and that the relief after the operation must be attributed to the suggestive effect of that procedure. Examining the X-ray picture, he is convinced that what the operators saw and attempted to remove was the transverse process of the seventh cervical vertebra. Under psychical treatment (hypnotism), rapid improvement took place even in the muscular atrophy. Considering the subject of cervical ribs and their production of symptoms by pressure upon the brachial plexus nerves, he concludes that their influence in this respect has been much exaggerated and thinks that even the X-ray findings should be interpreted with considerable caution.

7. *Study of Professional Cramps*.—Beginning with the history of the subject, the author first considers nomenclature. The terms "professional dyskinesia" (Jaccoud) and "coördinatory occupation neurosis" (Benedikt) seem to him most consistent with the facts, since the German "Krampf" conveys the idea of a convulsion, not that of a localized spasm, as the English "cramp" or the French "crampe." All the professional neuroses have in common: (1) localization in a group of muscles accustomed to work synergetically to the accomplishment of some determined act, (2) the fact that they only occur upon an attempt to carry out this act. For the production of a professional spasm congenital predisposition and frequent repetition of the same functional act is needed. They have been attributed respectively to central and to peripheral causes. The author thinks that they may arise from either source. Taking up peripheral causes, he considers: (1) Vascular (arteriosclerosis), (2) muscular, and (3) nervous (neuritis, neuralgia) origins, presenting under each head some illustrative case histories, both original and quoted. Under central causes he discusses: (1) The influence of the emotions, (2) professional neuroses associated with mental troubles, (3) the passage of one sort of spasm into another, (4) the association of professional spasm with mental torticollis, (5) professional spasms with associated movements.

Taking up symptomatology he considers first, "writer's cramp," which he describes as consisting of spasmodic, paralytic and tremor forms. Typewriter's cramp next occupies his attention, after which he considers successively, telegrapher's, pianist's, violinist's, seamstress', photographer's, barber's, forge-worker's, milker's, and cigarette-maker's cramps with some other of the spasms more rarely occurring in other trades and pursuits, the latest being an automobilist's cramp. As affecting the lower extremities, he describes a ballet dancer's spasm and under spasms affecting

neck, face and tongue he describes certain troubles occasionally observed in players of wind instruments and in persons who use their eyes a great deal in reading, microscopical work, etc. The prognosis of the professional spasms as to recovery is necessarily serious. The diagnosis in general is to be made from tics, the spasms of organic disease and hysteria.

The prognosis in any professional dyskinesia should in general be reserved. It will depend upon the cause, the concomitance or succession of several neuroses, the mental condition of the subject and the length of time during which it has existed. The diagnosis requires an inquiry into whether or not the functional trouble is exclusively limited to the professional act, neuritis, neuralgia and other organic troubles being eliminated. An inquiry into the mental state of the patient is also very important to the end of gaining the confidence of the sufferer and being able to exert proper influence over him.

Prophylactic treatment will consist in interdicting to those predisposed, occupations requiring exhausting mental and muscular effort, as well as all sources of intoxication, endogenic and exogenic. Internal medication is only indicated in the case of some general disease appearing to be at the bottom of the trouble. External physical treatment will comprise: Professional repose of short duration as needed—useful, but never alone sufficient and never indispensable; local treatment according to any special indication; local and general applications of electricity; massage; hydrotherapy, local and general; more powerful yet, sojourn at a health and water cure resort with its accompanying rest and change of scene.

Psychical treatment will consist in slow, patient and methodical reëducation of the affected muscles with such psychotherapeutic influences as can be exerted, which will effect a cure in many cases.

C. L. ALLEN (Los Angeles).

Journal de Psychologie, Normale et Pathologique

(Seventh Year. No. 1. Jan.-Feb., 1910)

1. The Psychology of the Feelings. OSWALD KULPE.
2. Periodic Psychosis, Melancholia. GILBERT BALLET.
3. Governesses' Delirium. CHAS. BLONDEL and PAUL CAMUS.
4. The Symptomatic Value of the Dream. C. MEUNIER.

1. *The Psychology of the Feelings*.—This is a study in the psychology of the feelings or sentiments. It is written in so syllabic and schematic a manner, with innumerable brief definitions, that to satisfactorily abstract the entire article would be quite impossible. As a suggestion for a working plan in the development of a psychology of the feelings the article deserves a full and careful reading.

2. *Periodic Psychosis, Melancholia*.—In a preceding article Ballet indicated that the maniacal state is one of the important constituent elements of the periodic psychosis. Now he purposes studying another element not less important, namely melancholia. Melancholia has often been placed in contrast with mania. The two states represented the obverse of each other and, so to speak, balanced one another. This view of the matter has been legitimately objected to lately. Clinically it is sufficiently accurate; for while the maniac exhibits motor agitation, the flight of ideas and an optimism, the melancholiac manifests the three cardinal symptoms motor inertia or apathy, psychic slowness or inaction, and sadness, all in direct contrast to the cardinal symptoms of mania. This is

illustrated in the accompanying report of a case elaborately analyzed psychologically.

According to Ballet there are four types of melancholia. In *simple melancholia* the cardinal syndrome is reduced to its elements, motor inertia, psychic retardation, and sadness. In *anxious melancholia* there is an exaggeration of the sadness, which becomes active. The anguish becomes the habitual state and not a mere passing exacerbation. *Melancholia with stupor* is characterized especially by an exaggeration of the mental sluggishness. In *delirious melancholia* the secondary delirium is the predominant feature.

Under the head of differential diagnosis a number of clinical similarities are discussed. Especially frequent is the confounding of melancholia with neurasthenia. Such an error of diagnosis is sometimes made on account of the inherent difficulties present, but generally it is the result of ignorance on the part of the physician as to the nature of melancholia. Neurasthenia a malady, sometimes constitutional, appearing in early years, from fifteen to twenty, brought on by physical, intellectual and especially moral indiscretions, durable, establishing itself slowly and also disappearing slowly, symptomatically revealed by the weighty cap-like headache of slight intensity which does not occur at night, sometimes accompanied by pain in the back near the sacral region, also by fatigue and amyosthenia, especially in the morning, by gastric and intestinal atony, by a particular mental state including inability to work and intellectual weariness cannot be mistaken for melancholia with its most dissimilar clinical picture, for melancholia begins with a more or less sudden onset as, for example, after a shock, an attack of typhoid fever, develops with remissions, and terminates abruptly. Melancholia is an outbreak; neurasthenia a state.

Other differentiations studied by the author are between melancholia and mental confusion, and melancholia and the stupor of dementia præcox. These differentiations he indicates by case reports rather than by descriptions.

3. *Governesses' Delirium*.—The first of the two cases herein elaborately reported by Blondel and Camus was that of a young woman, thirty-two years of age, engaged for the last ten years as a private instructor of children in well-to-do families of Poland and Russia. Her heredity was neuropsychopathic. Her symptoms were those of an erotic systematized delirium, having its origin in a morbid interpretation of her environment. There were present accessory ideas of grandeur and of persecution. The disease had existed for ten years and its progress had been extensive. There was present also a pulmonary tuberculosis of recent origin.

The second case was that of an English governess and lady's companion, forty-two years of age, who for the last five years had manifested a chronic systematized delirium resting upon a base of morbid erotic preoccupation. Ideas of persecution were also present. Cenesthetic disturbances occurred, especially in the genital sphere. Morbid interpretations took place. There were visual illusions and doubtful or rare and episodic hallucinations. The progress of the disease was extensive.

These two patients, teacher and governess, so very dissimilar in their origin, education, and mode of life, have thus been studied together because their delirium presented, in the midst of a mass of individual variations, not only certain fundamental characteristics in common, but likewise certain similar forms and mannerisms. In both the paranoiac delirium rested upon a groundwork of false interpretation. An erotic ele-

ment colors the fundamental theme in both. Constrained by their respective callings to a life of enforced celibacy while frequenting and teaching in the midst of a social environment superior to their own, they often found themselves exposed to the solicitations and attention of pupils and patrons of the most exalted rank. The romances that they weaved, the dreams of love and of marriage were in the one all of imaginary origin while in the other they were absolutely incapable of being realized and must of necessity have ended in nothing. Hence arose feelings of spite, opposition, and repeated chagrin. Their education, their instruction, their intellectual and moral level so superior to that of the well-to-do individuals with whom they dwelt easily developed in them a high opinion of themselves and of their value, thus exaggerating their autophilic sentiments and provoking that hypertrophy of the ego which was the origin of the delirious ideas of satisfaction and grandeur which they exhibited.

Among governesses and female private tutors these chronic systematized deliria appear with so much frequency and such special characteristics that many authors have devoted a special description to them under the name of the *governesses' delirium* (*gouvernantes Wahnsinn*). Ziehen, analyzing the chief etiological elements of this paranoid delirium, attributes it especially to repeated affective traumatism, the want of attention being in contrast with the consciousness of an intellectual superiority which often is very real, and the existence at the same time of an intense homesickness and anxiety in regard to the material affairs of life.

4. *The Symptomatic Value of the Dream.*—Meunier affirms, as the result of many careful observations, that the dream denotes, in every case, a particular mental susceptibility. It is the touchstone of psychic equilibrium. It would doubtless be going too far to consider the dream as a morbid phenomenon reduced to its simplest expression; for dreams are compatible with the most perfect state of health. The dream indicates a sleep that is incomplete. Such sleep occurs always at the two points when the individual is passing out of and into a state of wakefulness; and at these points dreaming would have to be considered a possible normal phenomenon. Every dream however which does not occur at one or other of these transition periods is to be regarded as an abnormal phenomenon, though not necessarily as a pathological one. In order to determine that it is pathological one must search for the cause of the anomaly. This may be found in one of the three factors that give birth to dreams, namely: the purely psychic elements, the sensations of extra-corporeal origin, and the sensations of intra-corporeal origin. When of psychic origin the dream appears to be due to an intellectual preoccupation or to an imperious emotion; the stronger the latter has been so much the more coherent will the psychic elements underlying the dream be. When the dream is of sensory origin, it awakens images corresponding with the nature of the impression received; but the interpretations put upon the latter may be various and exaggerated, in accordance with the usual habits of the dreamer. The dream is under such circumstances a panoramic vision in which the dreamer is a mere spectator or in the presence of which he plays quite a secondary rôle. When the sensations originate in touch they ought to be considered as the same sort of sensations that originate in the viscera, because both sets of sensations give rise to cenesthetic dreams. In the visceral forms however the dreamer is no longer a disinterested person; he here enjoys the principal rôle in the drama of which he is the center, and the events transpiring in his dream tend

toward a hurting of him in the part of his organism which served as the original cause of the dream; hence the element of localized pain which characterizes the cenesthetic dream.

Most of the dreams which the author studied appeared as prodromata in general pathology as well as in mental pathology. In fact it was the prodromic dreams which impressed the observers most. The same cycle of dreams takes possession of the patient during the evolution of his malady.

In mental pathology the persistence of the dream is an indication of the continued activity of the morbid process. The dream of the convalescent period is of the greatest importance in establishing the fact that the psychic equilibrium has not yet been fully and definitely regained.

METTLER (Chicago).

MISCELLANY

THE GENESIS OF THE AMNESIA IN KORSAKOFF SYNDROME. W. A. Giliavsky. (Sowreimonia Psychiatria (Contemporary Psychiatry), Vol. III. October and November, 1909.)

The writer reviews the literature and cites his own case with autopsy, in which amnesia typical of the Korsakoff syndrome occurred. He comes to the conclusion, as many authors did before him, that the psychosis described by Korsakoff incident to some cases of alcoholic neuritis is not at all characteristic of this disease. Beginning with concussion of the brain, with resulting localized edema, almost all the organic diseases which have a tendency to be localized may be attended by the amnesia in question. According to the author the cause of the amnesia is an invasion by a disease process at the left temporal lobe and more particularly a solution of continuity in the association fibers between the aural and visual centers. Here he goes on to explain how by the coördinate action of these two centers an image is established and stored up in the memory to be recalled to consciousness by either of the two centers or by their conjoined action. This part of the article is a mere repetition of the work of Wernicke. Why are there no changes in the temporal lobe, and whence the neuritis in the typical Korsakoff cases? The author solves the question somewhat ingeniously. Some poisons exogenic as well as endogenic are known to have predilections for certain parts of the nervous system. Alcohol is one of such poisons, and may by its toxic effects cause a molecular disturbance in the temporal lobe, and its association fibers. This disturbance makes itself known clinically in the form of amnesia long before histological changes can be demonstrated. The neuritis is a further step of the toxicity of alcohol.

HYMAN CLIMENKO (New York).

Book Reviews

DER ROTE KERN, DIE HAUBE UND DIE REGIO-SUBTHALAMICA BEI EINIGEN SÄUGETIERE UND BEIM MENSCHEN. Vergleichende anatomische, normal-anatomische, experimentelle und pathologisch-anatomische Untersuchungen. Prof. C. von Monakow; Direktor des Hirnanatomischen Institutes und der Nervenpoliklinik an der Universität in Zurich. Arbeiten aus dem Hirnanatomischen Institut in Zurich. Heft III, IV, 1909, 1910.

Von Monakow in these two numbers of his own "Arbeiten" has contributed another of his thorough studies to our knowledge of brain structure. For years he has been experimenting upon cats and rabbits, and has brought the results of his experiments in correlation with the pathological findings in man in lesions involving the red nucleus, and its connections with other portions of the central nervous system.

From the standpoint of comparative anatomy, the red nucleus may be divided into a large-celled nucleus, the nucleus magno cellularis, which lies caudad, and phylogenetically represents the oldest portion of the red nucleus, and into a small-celled nucleus, the nucleus parvocellularis. This latter lies more cephalad, and appears later in the phylogenetic series, although in man, and in the anthropoid apes it makes a larger cell mass than the nucleus magno cellularis, and may be divided into a number of secondary nuclei.

Three series of fiber systems are to be distinguished. A frontal system which originates in the frontal lobes, and the region of the operculum. The cerebellar system, represented by the superior cerebellar peduncle, which is distributed in the middle third of the red nucleus, and in part of the medio-ventral nuclei; some fibers pass apparently from the red nucleus to the dentate nucleus. The spinal or tegmental system contains the rubro-spinal tract, the rubro-bulbar tract, the rubro-loquaris to the lateral lemniscus, and the main portions of the fibers making up the fasciculus rubro-reticularis. The parietal, temporal and occipital lobes apparently are not in connection with the red nucleus. It is apparently a motor station. The connections with the frontal areas pass in both directions, and there are association fibers with the thalamus and the subthalamie region.

The general functions of the red nucleus is that of a switching station, and largely for motor impulses, and von Monakow shows how the rubro-spinal tract has lost some of its functions, as compared with lower animals, whereas the newly acquired fronto-rubro-tegmental tracts have become more and more important and are probably related to the general functions of upright position in the human species. He draws some analogies between these tracts and the pyramidal tracts, inferring that the former are complementary to the latter. They serve to specialize and to direct the spinal stimuli to the mid brain and pontine tegmentum, whereas the pyramidal tract bears a somewhat similar relation to the Rolandic area. This study is one of the most important that has appeared of recent years and deserves the most widespread attention.

SAGGI DI PERIZIE PSICHIATRICHE, ad uso Dei Medici e Dei Giuroconsulti. By Prof. Giovanni Mingazzini, Unione Tipografico-Editrice, Torinese-Torino; Milan, Rome and Naples.

This book, as its title indicates was written for the use of physicians and lawyers interested in psychiatry. It consists of 300 pages, divided into 7 groups or chapters. Each chapter treats of a number of cases which the author studied in the capacity of an expert alienist. What impelled the author to write the book was the general ignorance displayed by those who are often confronted with psychiatric problems. He decries the lack of importance attached to psychiatry by magistrates who seem to imagine that alienists wish to make a lunatic out of every criminal. This is due to the fact that the majority of (Italian?) magistrates "do not know the difference between neurasthenia and paranoia, between epilepsy and hysteria, and between the last and general paresis." (It sounds quite familiar!) The individual cases are all very interesting especially from a forensic point of view, and fairly cover the subject of psychiatry. The classifications, however, are a little out of date, and the psychological part is rather superficial. On the whole the subject is well worth reading by those interested in expert testimony.

A. A. BRILL (New York).

FUGUES ET VAGABONDAGE. Etude clinique et psychologique. Par A. Joffroy, Professeur à la Faculté de Médecine de Paris, et R. Dupouy, Médecin de l'Asile Saint-Yon. Felix Alcan, Paris. 7 fr.

The appearance of the works of Josiah Flynt in English, and of Wilmanns in German upon the tramp has served more than any other factor to focus attention upon the phenomenon of vagabondage, and the work of the latter author in particular has served to raise the level of the problem to that of a science. The present work, one of much merit and penetration, is a worthy addition to the preceding volumes, and inasmuch as its scope is somewhat wider,—including the series of phenomena known as fugues, or flights, which may or may not be related to vagabondage, it possesses greater interest for the psychiatrist.

The authors first, in an introductory discussion, take up the general psycho physiology of our common acts, and then present a rough outline or classification of the various types of fugues, and of vagabondage. They describe the varieties of fugues, beginning with those of the child.

The authors have abandoned the older psychiatric standpoints, and hence we find fugues described purely as symptomatic expressions of various psychotic states, and further they have performed a signal service by attempting to show the ear marks, as it were, of these several varieties. Thus are described the flights in hysteria, epilepsy, in manic excitement, in depressive states, in various toxic deliria, in weak minded states, in demented conditions. Paranoid vagabonds are well described, even if the essential dementia præcox features are not always seen with clearness; and the reflections upon what the authors term "ambulatory paranoia" and the "vagabond temperament," are not only interesting, but are keenly analytical and highly suggestive. They incidentally show what a wealth of psychological material may be gathered from the social protestors—a material which has been touched upon from the artistic side by Flynt, and fundamentally analyzed in Wilmanns' *Zur Psychopathologie des Landstreichers*.

We can commend this volume most heartily. It contains a large number of well observed cases, and is scholarly throughout, yet lacking nothing in force and brilliancy.

JELLIFFE.

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Original Articles

A REVIEW OF SERUM REACTIONS IN CASES OF NERVOUS AND MENTAL DISEASES¹

By E. P. CORSON-WHITE, M.D., and S. D. W. LUDLUM, M.D.

(From the Laboratory of Neuropathology in the University of Pennsylvania and the wards of the Philadelphia General Hospital.)

Pathogenic conditions reflect themselves in the blood, and the nervous system is often the first to suffer from the dyscrasia, and yet the many years of careful and systematic morphological study of the blood in neurological and psychiatric practice have yielded little of diagnostic importance. A picture changing from normal to varying degrees of anemia, generally of a chlorotic type, was found. Many interesting single facts were added, but the blood deterioration could only rarely be regarded as a factor in the insanity or nervous phenomena. Every blood test described has been applied to these conditions, but until the advent of the Wassermann² reaction, in 1906, no evidence of etiological value was derived from the study of the blood, except in rare instances. With the complement fixation test, however, a new and large field was opened up, not only to decide upon the syphilitic genesis of diseases, but to watch the effect of treatment, and to clear up the causes of some of the obscure conditions occurring in the nervous system. The importance of this reaction in all departments of medicine increases as the better command of the complicated

¹Read at the twenty-sixth annual meeting of the American Neurological Association held in Washington, May 2, 3 and 4, 1910.

²Wassermann, Neisser und Brück; *Deutsch. med. Wchnschr.*, 1906, XIX, 745.

technique adds to its specificity. In neurology its value is very great in distinguishing between syphilitic diseases of the central nervous system and central gliosis, tumors, multiple sclerosis, etc.; but its importance is not yet fully appreciated by the general profession.

In this paper we wish to report the result of two years' work with the Wassermann reaction, its modifications and simplifications, with a parallel study of some other changes found in the blood of mental and nervous diseases. Practically all forms of mental and nervous trouble were subjected to Wassermann's, Noguchi's, Weil's and Much's tests. The conclusions in this paper are founded upon examinations made in 1710 cases of nervous and mental diseases. Our conclusions in the other tests, *i. e.*, Fornet and Schereschewsky's precipitations, globulins, etc., are based on at least three hundred cases each.

Fornet and Schereschewsky's test shows the relation between the precipitin reactions and the binding of complement. In those cases where no visible precipitate occurs on the contact of precipitinogen and its specific precipitin, a binding of complement is still demonstrable. As a diagnostic aid, the Wassermann or the Noguchi reaction is the most reliable and delicate test for syphilis. The precipitation tests with distilled water, dilute alcohol, taurin, sodium glycocholate, sodium taurocholate, lecithin, etc., while of some scientific interest, are, we think, too unreliable for diagnosis. The percentage of positive results are highest in para-syphilitic diseases (92 per cent.), and, in our experience, next highest in non-specific disease (38 per cent.).

Of much more value is the butyric acid test devised by Noguchi.⁴ This test demonstrates the almost constant increase in the globulin of the blood or cerebrospinal fluid in luetic infections—an increase less definitely shown by Klausner's⁵ precipitation test. Noguchi, when studying the globulins of syphilitic sera and cerebrospinal fluid, found that the euglobulin fraction held the binding substance, and would itself give the Wassermann reaction with the same titer as the original serum. Based on this observation, Gay and Fitzgerald⁶ devised an euglobulin test.

³ Fornet and Schereschewsky: Münch. med. Wchnschr., 1907, LIV, 1471.

⁴ Noguchi, Serum Diagnosis of Syphilis, J. B. Lippincott, 1910.

⁵ Klausner, Wein. klin. Wochschr., 1908, XXI, 940.

⁶ Gay and Fitzgerald, Boston Med. and Surg. Jour., CLX, 1908.

Both Gay's and Noguchi's globulin tests are of confirmative value. The englobulin test is a little more clearly cut, but possesses otherwise little or no advantage over the globulin test. The increase of globulins has been noted experimentally in the process of immunizing animals to bacteria or organic substances. We obtained positive results in one case of tuberculous meningitis, one of caries of lumbar spine, and in one brain tumor. In the last, however, the Wassermann reaction was positive. Gay and Fitzgerald⁶ report cases of positive results in acute infections. These should give rise to no confusion, however, if all factors of the case are taken into account. In the cerebrospinal fluid, any inflammation of the meninges will give positive results.

The globulin increase appears before the Wassermann reaction and remains longer in cases under treatment. In varying degrees, it constantly accompanies primary, secondary and tertiary syphilis, tabes and paresis. In paresis the test is strongly positive in the blood and cerebrospinal fluid. In cerebrospinal lues and tabes, it is a much more constant symptom than the complement fixation test, which is often weak or absent. The non-specificity of the test detracts from its diagnostic importance, but not from its corroborative value. In our experience the absence of the butyric acid reaction is more proof of the absence of syphilis than the absence of the Wassermann reaction. The necessity of performing this globulin test appears in those cases with a luetic history, which are being watched for effect under treatment. Every case in which treatment was stopped while this increase in globulin persisted had a recurrence of Wassermann reaction in a short time. As an illustration: E. M. received a severe injury to his head and back, was unconscious four hours, then gradually recovered and went back to his work. Seven months after his injury, he developed a typical spastic paralysis. When seen by us eleven months later he denied lues and any specific medication and the Wassermann and the Noguchi reactions were negative, but the globulin was faintly positive. He was put on tonic treatment, and, at the end of two months, the globulin test was strongly positive, Noguchi and Wassermann reactions were present. In this case, probably, the injury lowered the resistance, so that a weak latent lues became active. The absence of the first reaction was due to treatment, the nature of which had not been understood by patient.

Another corroborative test for syphilis is that proposed by Weil,⁷ depending upon the alterations in the erythrocytes in response to the syphilis toxin. He found that the red cells, after infection with syphilis, exhibited first an increased fragility toward some hemolysins, especially toward cobra venom, and that later they acquired a marked resistance. The increased resistance appears later than the Wassermann reaction, and remains longer than any test in treated cases. In our study we obtained positive results in 94 per cent. of the cases of frank syphilis, one case of paralysis agitans, and in only 20 per cent. of cases of syphilis of the nervous system, including tabes and general paralysis. The test depends upon the changes in the lecithin content of the cell, of which cobra venom is an indicator. Weil suggested that the negative reactions in cerebrospinal lues were due to the fact that the virus of syphilis will spare the lipoids of blood cell when it attacks those of the nervous system. When the amount of lecithin is decreased, the Wassermann reaction and Weil's test are positive. A negative outcome of a fixation test in a case of positive lues (errors in technique excluded) may be due to an elevation of the lecithin content. Quarrelli⁸ found that injections of lecithin in cases of tabes and cerebrospinal lues changed a positive to a negative reaction in a large per cent. of the cases examined by him. In a few cases, however, the reaction increased in intensity.

Wolfsohn⁹ found that after etherization a transitory positive reaction might occur in non-luetics. Narcotics, as alcohol and morphine, gave with us some positive results, both to cobra and Wassermann tests; but in no case could we exclude syphilis, or feel that the reaction was in any way due to the lipid destroying power of the narcotic.

In a small number of cases, tabes, cerebrospinal lues and depression, a moderate, but not uniform, resistance to the hemolytic action of mercuric chloride was observed. In untreated primary cases this resistance was absent, but was present to a slight degree in untreated secondaries, although not as strongly as in those cases just stopping a three to five months' treatment. This change in cell resistance may be due to the generalized in-

⁷ Weil, R., *Jour. Infect. Dis.*, 1909, V, 688.

⁸ Quarrelli, *Gaz. degli Ospedali e delle Cliniche*, Milan, January 24, XXX, 1907.

⁹ Wolfsohn, *Deutsch. med. Wochenschr.*, March 17, 1910.

creased resistance to hemolysins produced as a reaction to the virus of lues, or it may be a possible adaptation of the cells to mercurial treatment. In experimental trypanosomiasis, a biologically related disease, resistance of the cells to drugs has been repeatedly observed. Experimental injections of hemolysins give a picture similar to that caused by the syphilis toxin; first anemia of a more or less severe grade, early fragility of the cells to hemolysins, followed by an increased resistance.

These changes probably affect the red cells while in the bone marrow, and not in the circulating blood; if so, other cells should be affected also by the virus. This may be one reason why mercurial treatment is ineffectual in parasyphilitic diseases.

To anisotonic salt, however, no clear cut resistance was found; if present it was accidental. Cells markedly resistant to cobra or other hemolysins, would often dissolve quickly in very slight deviations from the isotonic solution, and other cells showing little resistance to hemolysins would withstand marked dilutions of salt. The resistance to a specific circulating poison has probably a certain degree of specificity, and does not run parallel to resistance to anisotonic solutions.

The Much¹⁰ reaction is the inhibition of cobra venom hemolysis of normal red cells, by the serum of manic depressive disease and dementia præcox. Using Much's technique, we obtained positive results in one case of cerebrospinal lues, two cases of general paralysis, one tertiary lesion of skin in a man with no mental disease in his history, one of exophthalmic goitre, one of confusional insanity, and in two cases of epilepsy. In only three out of thirty-seven cases of manic depressive disease did we get a positive response, but obtained positives in 62 per cent. of the hebephrenic type of dementia præcox, and 80 per cent. of the catatonic form. In studying the resistance of cells to hemolysins we found some differences in the behavior of cells of normal individuals to the dissolving action of cobra venom, even when cells had been washed the same number of times, at same speed, in same centrifuge, and revolved for the same number of minutes. We therefore modified the Much reaction by using for our indicator a cell whose resistance was such that it was entirely dissolved in a 1/5,000 solution of cobra venom in thirty minutes, at 37° C. With this modification we obtained positive results only

¹⁰ Much, Münch. med. Wochenschr., LVI, 1001, 1909.

in dementia præcox, 87 per cent., most strongly marked in catatonics, 100 per cent. All serums prevent in a slight degree the hemolytic action of cobra venom on corpuscles, but it is present in a much more pronounced manner in dementia præcox.

The test is of some diagnostic value in dementia præcox, but only if *exactly* the same technique is used on every occasion with careful titrations of the venom and standardizations of the cell indicator. We could demonstrate no relation between the test and the Wassermann reaction, nor did it explain any of those cases of definitely non-luetic psychosis which gave weak positive or doubtful Wassermann reaction. Noguchi first called attention to these cases, and also to the fact that they gave positive results only with the serum, the reaction with the spinal fluid and butyric acid test being negative. We have so far never found a positive Wassermann and a positive butyric acid test, except when syphilis was present. In our non-luetic positive cases we repeated the test, using the plan proposed by Browning and McKenzie;¹¹ that is, to count as positive only those cases in which five more doses of complement are absorbed by the antigen-antibody compound than that absorbed by antigen and serum alone. Therefore, we first made a preliminary titration of the serum and antigen to determine the amount of complement absorbed by them alone. Many of the depressed mental states, which had given positive or doubtful reactions to the Wassermann technique, became negative by this empirical measure. The complement bound by the serum of all of our depressed cases varied between three and seven units, in one instance nine, and in no other condition so far examined by us have we found this high binding quality, although lately it has been reported in leprosy. It probably depends on the presence of some colloidal substance in the serum, and shows that chemical differences in the constitution of the blood sera may occur in mental disease. Normal cases never absorbed more than two units. Manic states were usually a little higher, between two and three. This titration may be of some diagnostic value. At present we state it very guardedly. The cases studied in the detention wards of the Philadelphia General Hospital and placed in the depressed group by the blood picture, later bore out the diagnosis psychologically. In all, sixty-seven cases of depression, irrespective of mental form

¹¹ Browning and McKenzie, Jour. Path. and Bact., 1908-9, XIII, 325.

of disease, have been studied, and all gave a high complement binding property.

In primary syphilis we found the most marked variations in results with the different syphilitic tests. An average of all of the first Wassermann examinations of our primary cases gave 60 per cent. positive results. The average of the fourth examination gave positive results in 98.5 per cent. This difference is probably due to several factors; the individual reaction to the virus, the virulence of the infecting agent, interference from the presence of complementoids, and the time elapsing between the infection and the examination. In most negative cases, subsequent examination at frequent intervals will sooner or later become positive. As in all biological reactions there are some cases that do not react; this is rare, but it detracts slightly from the value of the reaction. Illustration of this fact was the case of J. E. P. This man had an undoubted syphilis. He was examined first during the secondary eruption with negative findings. The disease was refractory, but finally yielded to very large doses of mercury. Three examinations were made during this latent period by different competent observers, and were in every case negative. His poor health at this time was thought to be due to over-mercurialization. One month after the last examination he developed convulsions and paraplegia. These cases, fortunately, are rare, but they emphasize the necessity of never estimating the value of any diagnostic laboratory test, except when taken in connection with all the other factors of the case.

In primary syphilis the presence of the spirochæte is the earliest positive sign. After it, a gradual steady increase in the globulins of the blood serum appears, and, at the same time, an increased fragility of the red cells to cobra venom and some other hemolysins. The Justus test for syphilis and the so-called mercurial test, we found corresponded to this period, and ceased to be positive when the cell resistance was firmly established. At the fourth or fifth week after the appearance of the chancre, the Wassermann reaction becomes positive, and increases in intensity as the disease approaches the roseola, or is modified by treatment. The fixation phenomenon is an indication that the infection has become generalized.

In the secondary stage the complement fixation test and the globulin increase are present in 98 per cent. to 100 per cent. of

cases. Negative reactions, when they do occur, are generally the result of treatment, or very rarely to a refractory organism or lack of response in individual to stimulus of the virus. The fact is so rare that, unless very definite signs of syphilis are present, repeated negative findings should speak strongly against syphilis. The washed red cells acquire a marked resistance to cobra venom and some other hemolysins. The anemia is fully developed, the lowest hemoglobin count being reached coincidentally with the appearance of the rash. The hemoglobin remains low for a short time, and gradually rises as the exanthem begins to retrogress.

After the disappearance of the secondary, the patient enters upon a period of latency. Because of the frequent relapses of this disease much work has been done as to its cause. Virchow¹² thought the lymph glands formed the chief repositories for syphilitic virus from which the intermittent infection of the organism took place. Often, however, the relapse occurs where there is no demonstrable swelling of the glands. A mass of evidence based on repeated histological examinations has established the idea that, not only the glands, but every original seat of a lesion, may be a repository. While syphilis is a chronic dyscrasia, this by no means involves the necessity that the blood should at all times contain disease products. The latent periods of this disease may mean only that the organisms in the body, or floating in the blood stream, are so reduced qualitatively or quantitatively that they no longer are capable of evoking a lesion, or stimulating the production of antibodies, and this is entirely in line with the findings with the various tests. If, however, the resistance of the individual is lowered by trauma, infection, or other causes, this equilibrium between host and weakened spirochæte is lost, and the disease becomes manifest again. This manifestation may be simply a recurrence of the Wassermann reaction, or it may be tertiary lesion of the skin, bone, viscera, or nervous system. These localized residual foci of infection account for the non-symmetrical character of tertiary lesions, and for the smaller number of positive Wassermann reactions.

It is in these latent cases that we find the greatest value of the syphilitic tests. Often only one test is present, generally the globulin increase. In cases where there is a definite syphilitic

¹² Virchow, quoted by Lesser, *Beiträge zur klinischen Med., Festschrift Senator gewidmet*.

history, a positive globulin result should not be disregarded. In three of our cases it was disregarded, and we were confronted in a short time with strongly positive Wassermann reaction, and in one case with a typical syphilide. In a fair proportion of the neurasthenic states, headaches, paresthesia, etc., a positive Wassermann reaction is obtained, and, very often, is the only definite sign of the disease. Treatment of the disease instituted at this period may save a patient from the more serious ravages of an active lues. Illustration of this is the case of F. M., who presented himself complaining of fatigue, depression and general nervousness. He had no demonstrable signs of syphilis, but a strongly marked positive Wassermann reaction. No syphilitic treatment was given and in a few weeks he appeared in the skin dispensary with typical tertiary lesion on hands and arms.

The latent periods of syphilis become of very great importance also in the study of hereditary lues. A latent syphilitic with no clinical manifestations can give birth to a definitely syphilitic child. In the marriage of syphilitics the frequent study of the reaction is of utmost importance. Bar and Duanay¹³ found that the percentage of positive results was higher in the off-spring of latent syphilitic mothers than in cases of florid syphilis, due to the fact that the latter cases were treated. We know that the Wassermann reaction disappears under treatment, and even under short courses, and that in a considerable number of cases it returns with more or less intensity after the cessation of treatment. Cases of general paralysis may arise ten or more years after an infection, late relapse may occur anywhere between five, ten, or twenty years after the initial sore, and the reaction has been found ten and thirty-five years after an infection. It becomes, therefore, difficult to say that a negative reaction, even if continued, means cure. The test is only in its fourth year, and sufficient time certainly has not yet elapsed to speak on this subject with any authority. It is still well to abide by the old laws for the marriage of luetics. Where pregnancy occurs in these marriages, the mother should be examined as early as possible in the pregnancy and thoroughly treated after the first positive findings.

Congenital lues gives a positive response to practically all the luetic tests. Under treatment the reaction weakens as the case improves, but not in a parallel manner. In only two of our cases

¹³ Bar and Duanay, *Obstetrique*, Paris, March, 1909.

it disappeared under treatment. The effects of congenital syphilis are many and far reaching. A moderate percentage of cases of convulsions, tremors, hydrocephalus, monospasms, paralyses, pseudo-paralyses, neuralgia, infantilism, imbecility, idiocy and progressive arrests of development, etc., give positive reactions. Cases of mental enfeeblement, especially where it ensues after a certain degree of intellectual development has been attained, are very often specific. In the majority of our cases of cerebral syphilis in children, we found some other evidences of lues, but a few had an entire absence of any stigmata.

Mott,¹⁴ in his third Morrison Lecture, quotes Fournier's classification of parasyphilitic affections due to hereditary syphilis. He tries to prove syphilis the fount and origin of almost every hereditary defect. Following his classification, we examined nine cases of dystrophies, seven of which gave negative results. Two other cases resulted positively; both of these children beside the dystrophy were distinctly feeble-minded, and the mothers gave history of miscarriages. In epilepsies, forty-nine cases, we found no case with a hereditary syphilitic basis, and obtained positive results only in those patients who gave a definite history and in whom the epilepsy followed the wake of the infection.

Among mentally defective or backward children, forty-nine cases, we obtained 36 per cent. positive results. Shuttleworth,¹⁵ examining imbeciles for physical signs of syphilis, found only 1.17 per cent. positive. In the majority of our cases the children examined were not manifestly syphilitic. In some the mental backwardness and the Wassermann reaction were the only signs present. The tests help to the early recognition of the underlying cause and the removal of the toxic substance by proper treatment permits these children to develop.

Also Ziehen and Fournier¹⁶ have years ago emphasized the improvement of defectives under mercury, and Joseph¹⁷ cites cases which illustrate the great benefit which may follow treatment based solely on a positive Wassermann reaction, in dubious cases of inherited syphilis, normal except for some slight deviation.

In tertiary syphilis, whether it attacks skin, viscera or nervous system, the number of positive responses to specific tests falls very

¹⁴ Mott, F. W., *British Med. Jour.*, February 20, 1910.

¹⁵ Shuttleworth, *Am. Jour. Insanity*, 1888, p. 381.

¹⁶ Fournier, *Syphilis Héritaire Tardive*, 1886.

¹⁷ Joseph, *Archiv. Kinderheil Kunde*, April 17, 1909.

markedly from that observed in the secondary period, but they are much more frequent than in latent syphilis. This may be due to the weakening effect of treatment on the organism, so that it becomes unable to stimulate so markedly the antibody formation, or to a localization of the virus. In tertiaries the Wassermann reaction is of greater importance than in the earlier stages. In lesion of bones, five cases, the reaction has been with us strongly positive. Three were cases of multiple joint involvement, two of which gave also positive v. Pirquet reaction. In one case the father gave a positive history and positive syphilitic reaction. In another child an examination of the parents was not possible, but child improved in general health under mercurial treatment.

Winfield¹⁸ reported a series of cases of bone disease in children, suggesting the possibility of hereditary syphilis as a predisposing cause for the development of the tuberculous process.

Swift¹⁹ also reported the case of a man with a sinus of the rib and some softening of apices of lung. He was examined for tuberculosis and pathologist reported tuberculous tissue and tubercle bacilli. He gave a positive Wassermann reaction and the sinus healed under mixed treatment. It is well in cases of bone disease to submit the patient to both examinations; both infections occur together, the one probably making a very suitable soil for the growth of the other, or it may be possible that the tuberculous process calls to activity a latent syphilis by the stirring up of residual foci.

When tertiary syphilis attacks the central nervous system, the cobra venom test ceases to be of any material help, 22 per cent., the complement fixations appear only in about 67 per cent., and the globulin increase becomes the most constant sign, 94 per cent. The failure of the Wassermann reaction in these cases is a serious handicap, because it is often necessary to have some help in separating brain tumor or multiple sclerosis from cerebrospinal lues. Not infrequently also a cerebral tumor may arise in a syphilitic case and the positive reaction gives evidence of syphilis somewhere else in the body. In the majority of the cases seen by us, the individual had already had several courses of treatment, or was then under treatment with mercury and iodide; those seen in the beginning of their trouble gave much higher results. In

¹⁸ Winfield, Jour. A. M. A., 1909, p. 1236, abs.

¹⁹ Swift, Cleveland Med. Journal, May, 1910, p. 331.

eleven cases of genuine multiple sclerosis we obtained no positive results. In syphilis of the nervous system the value of the reaction has been very often described and its position definitely established. The reaction in these cases changes less easily under treatment, but very definitely. The strength of the reaction has no relationship to the extent of the disease.

In the parasyphilitic states again the globulin increase is the most constant finding; in these conditions parallel examinations of blood and cerebrospinal fluid are to be commended as one means of differentiating between tabes and taboparalysis.

The Wassermann reaction of the spinal fluid is a measure of the process of disintegration of the nervous system, or of grave disturbances in its metabolism. In tabes the complement fixation test is present in blood of 62 per cent. of cases. In cerebrospinal fluid in 40 per cent. of the cases, globulin increase in 98 per cent. In general paralysis, on the contrary, blood averages about 98 per cent. to 100 per cent., cerebrospinal fluid 98 per cent. to 100 per cent., globulin 98 per cent. to 100 per cent. If the difference in the blood and spinal fluid reaction, together with physical signs lately described by Fischer,²⁰ can separate a simple tabes from a tabes which will go into paresis, we certainly have a powerful factor for the peace of mind of many patients.

In the preparalytic stage of general paralysis it is of tremendous value for the protection of a family. During this stage a man's condition is masked by a neurasthenic syndrome. If there is any time in the history of paresis that specific medication may be of avail, it must be at this stage, when some intercurrent condition is first calling from abeyance to renewed activity those metabolic processes which were originally set up as a result of syphilis. Marie and Levaditi found a parallelism between the strength of the Wassermann reaction and the progress of the paresis. There was a correlation between the breaking down of nervous tissue and the amount of the colloid with which the reaction is associated, and on which it depends.

In mental conditions the Wassermann reaction has so far shown lues to have little etiological importance except in the cerebral manifestation of hereditary syphilis, general paralysis and syphilitic insanity. As an accidental complication it may, of course, occur in any psychosis. The Much reaction gave a high

²⁰ Fischer, Jour. A. M. A., August 27, 1910.

percentage of positive results in dementia præcox. The depressed conditions all gave an increase in complement absorbing power of serum and never gave a Much reaction. The colloidal substance present in these depressed cases does not influence the Much reaction, nor does it cause a true fixation of complement.

In conclusion we think that: The Wassermann reaction is enhanced in value by the parallel use of globulin tests and the cobra venom test; that: The Much reaction, by careful standardization, may be made of much diagnostic value in cases of dementia præcox.

Regarding the complement absorption of the serum, enough work has not yet been done to do more than guardedly report results. It is of interest in neurology, but final conclusion must be deferred.

VISUAL DISTURBANCES IN MULTIPLE SCLEROSIS.
THEIR RELATIONS TO CHANGES IN THE VISUAL
FIELD AND OPHTHALMOSCOPIC FINDINGS.
DIAGNOSTIC SIGNIFICANCE. REPORT
OF TWELVE CASES

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Since Charcot and his pupils first called attention to the ocular defects associated with multiple sclerosis, a vast literature has grown around the subject. Uhthoff and others have demonstrated that the optic nerves are affected more frequently than in tabes, more often than in any other disease of the nervous system except cerebral tumor. This fact proves valuable in the differential diagnosis, especially in the earlier periods of the disease, when visual disturbances frequently occur.

While the ocular defects of sclerosis en plaques are quite as transitory as the accidental conditions of a functional nervous disease, a definite visual defect will be found when our attention is directed to the association and disassociation of visual acuity, visual fields, color fields, changes of adaption, with negative or positive ophthalmoscopic findings. It is not the significance of the disturbance of these special functions per se in the absence of ophthalmoscopic findings, but the manner of association or disassociation in which they occur, that differentiates the ocular disturbances of a functional from an organic nervous disorder. In the symptomatology this organic disease has two general conditions in common with the functional disorders of the nervous system and especially with hysteria, namely, the peculiar combinations and transitory character of symptoms which are in their anatomical distribution apparently unsymmetrical and unsystemic.

Hysteria is probably the most important functional disorder to consider in the differential diagnosis. The question that confronts us when interpreting ocular symptoms is, (1) whether or not they are independent of disease of the visceral organs; (2) the consideration of other neurological conditions, especially the

reflexes, and (3) the variety and character of the visual disturbances and their significance, per se as well as their associations.

In the following briefly summarized description of twelve cases which I believe illustrate the assertions made above, I wish it understood that all conditions not mentioned in the records of these cases were negative although carefully looked for and considered in the analysis of the patients. All statements of negative results were omitted for the sake of brevity.

CASE NO. 1. A man 32 years of age, an American and a travelling salesman by occupation, entered the University Hospital, complaining of weakness of the arms and legs. He stated that he became easily fatigued, especially in walking. He has been unable to carry his grip any distance, while following his occupation, on account of weakness in his arms and hands. For a few days he had incontinence of urine. There is nothing of interest in the family history and the patient has always been well up to the present illness.

In June, 1908, he had a slight attack of measles, lasting five or six days. During this time he was not confined to bed and made an uneventful recovery. About a month later, after taking up his occupation, he noticed the symptoms above described. He gave up his work and after a short period of rest regained his natural strength. About two months later, the weakness in his arms and legs returned. At this time he had some blurring of vision and numbness and stiffness in the lower extremities. When he becomes tired, he has a tremor in the hands, which troubles him in writing. Muscular strength in the extremities is much diminished. The biceps and triceps tendon reflexes are much exaggerated, also the patellar tendon reflexes. The normal plantar reflex was not obtained on the right side, but the Babinski toe reflex was present on the left. There was no ankle clonus. He has double vision when fixing his eyes for near objects. There is no demonstrable extraocular paralysis when testing the individual eye muscles. A marked horizontal nystagmus is present in both eyes. The left pupil is somewhat larger than the right. Both pupils react to direct and consensual light stimulation promptly and react in accommodation. Vision O.D. 15/30; O.S. 15/30; was not improved by lenses. The margins of the discs of both eyes are markedly reddened. A functional examination of the visual field revealed an irregular contraction and paracentral scotomata (see Plate III, chart 10).

CASE NO. 2.—An American farmer, 55 years of age, applied for treatment for general nervousness and headache, with occasional blurring of vision and dizziness. For some time he had suffered a great deal from insomnia. The family history is good.

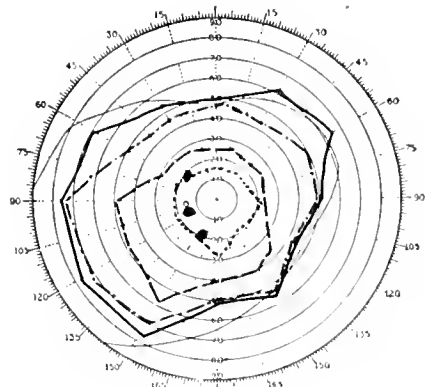
He is a man of good habits and, with the exception of the ordinary diseases of childhood, he has been well until the present ailment developed. The patient says that at times he has been almost entirely free from any disturbance, but of late the condition is more constant. He has had some wandering pains in the lower extremities and some stiffness and weakness in walking. The gait is distinctly spastic and there is some swaying when standing with the eyes closed. Muscular strength in the extremities is diminished. He has a marked intention tremor. The patellar tendon reflexes are exaggerated. Ankle clonus and the Babinski toe reflex are present on both sides. A true horizontal nystagmus is marked in both eyes. Vision O.D. 20/30; O.S. 20/30. In the fundus were found tortuous retinal vessels. The functional examination of the eye revealed multiple scotomata, contraction and overlapping of the color fields (see Plate II, chart 5).

CASE No. 3.—The patient's chief complaint is weakness in the limbs, deafness and gradual loss of vision, which has extended over a period of seven years. He is 51 years of age. His family and personal history with reference to deleterious influences is entirely negative. During the development of the present trouble there have been many periods of remission and exacerbation. At times during the earlier part of the disease he was quite well and free from any marked disturbance. Failing vision and hearing, he claims, were the earliest symptoms, while the weakness in the extremities came on somewhat later and was quite constant. He developed an intention tremor in the hands about the third year, but at first it was only present when he became tired. This is now well developed. His gait is spastic and he is obliged to walk with two canes. Muscular strength is markedly diminished. The tendon reflexes are increased, particularly the patellar tendon reflexes. There is an ankle clonus and Babinski toe reflex on both sides. He has occasionally double vision. There is an insufficiency of the left internal rectus and at times the eyes do not converge normally. Vision is O.D. 10/40; O.S. 10/40. There are patches showing choroidal atrophy in the fundus of the right eye and beginning choroidal crescent in the inferior temporal quadrant of the left eye, a marked paling of the disc in the lower temporal quadrant of both eyes; the fields show multiple scotomata (see Plate II, chart 6).

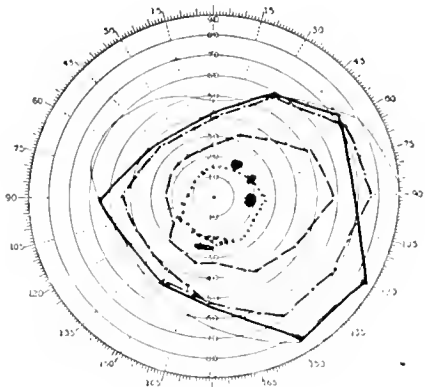
CASE No. 4.—The patient, a woman 30 years of age, physically well developed and of good general appearance. She complains of general nervousness and weakness in the lower extremities. More recently, she has not been able to do her household duties without numerous resting periods on account of weakness in the upper extremities. The family history is not of interest in connection with the present trouble. Five years ago she had a severe attack of the measles. Convalescence was protracted and

PLATE 1

CHART 1.

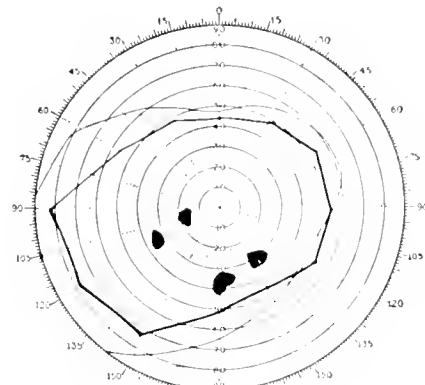


Left eye vision 20/30

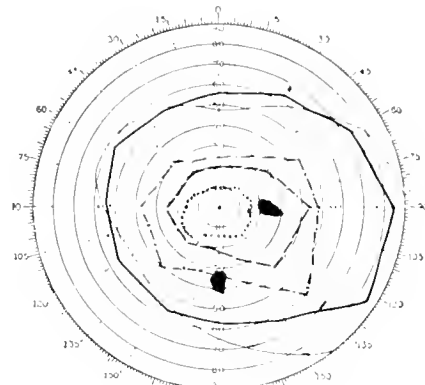


Right eye vision 20/30

CHART 2.

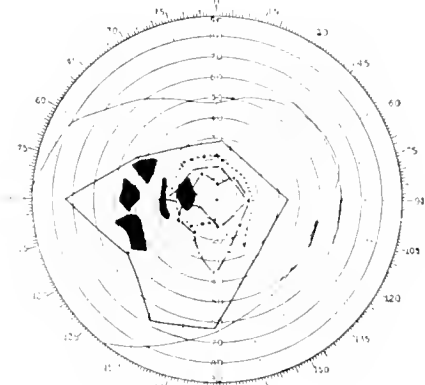


Left eye vision 15/40

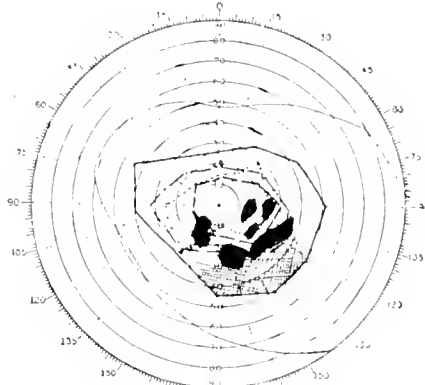


Right eye vision 15/40

CHART 3.

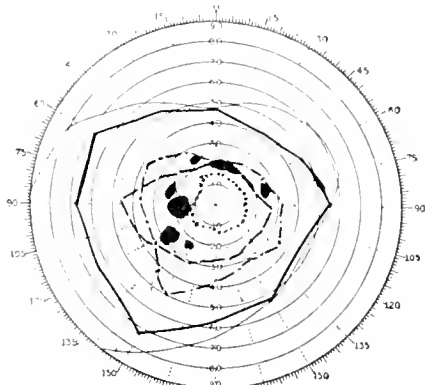


Left eye vision 15/30

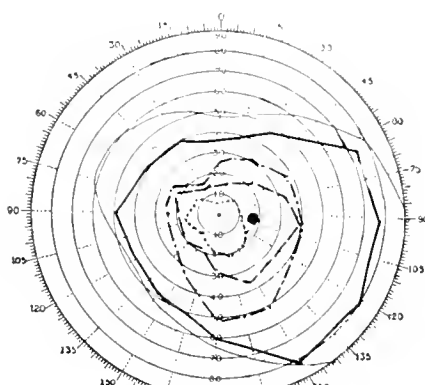


Right eye vision 15/50

CHART 4.



Left eye vision 20/40



Right eye vision 20/30

Field of vision ——— White - - - - - Blue Green for 5 mm. □
Relative scotoma ▨

she has never regained her normal strength. The present trouble appeared about two years ago. She has attacks of headache and dizziness lasting a day or two. Of late these attacks are more frequent and the dizziness more constant. Insomnia has been troublesome for some weeks. The patient's station appears normal. She has a slight tremor of the hands when they are extended, which becomes more marked during voluntary effort. Muscular strength is diminished. The tendon reflexes are increased, particularly those of the lower extremities. Normal plantar reflex was not obtained and no Babinski toe reflex. There is an inequality of the pupils, left being larger and does not react so readily to direct light stimulation as the right, although both react to light and in accommodation. In fixing near objects, there is a marked horizontal nystagmus, somewhat more marked in the left eye, and choroidal atrophy in the left eye. Vision O.D. 15/20; O.S. 15/20. Visual fields contracted and multiple scotomata in both eyes (see Plate I, chart 2).

CASE No. 5.—The patient, an American, 50 years of age, complains of numbness and weakness in the lower limbs, headache and dizziness, which he first noticed about a year ago. The weakness and numbness began in the left leg, extending to the right and finally to the upper extremities. In the past few weeks he has been unable to follow his occupation. His vision has been failing for several months. Vision is 20/40 O.S.; 20/30 O.D. In fixing near objects there is a horizontal nystagmus in both eyes. The visual fields are somewhat contracted, with multiple scotomata in the left (see Plate I, chart 4). The fundus of both eyes presents an optic atrophy in the papillo-macular quadrant. The tendon reflexes are very much exaggerated, especially the Achilles and patellar tendon reflexes. Ankle clonus and Babinski toe reflex on the right side.

CASE No. 6.—A German girl, 21 years of age, of a nervous temperament, complained of pain in the lumbar region, radiating to the inguinal region and to the lower extremities which she ascribed to disorders of the pelvic organs for which she has been treated. Occasionally she has incontinence of urine for short periods. About once in two weeks she has severe frontal headaches and dizziness. During these periods she is sleepless for several nights. Her gait is unsteady when walking with the eyes closed. She has a marked intention tremor of both hands, which is apparent in her handwriting. Muscular strength is diminished. The tendon reflexes are exaggerated. Plantar stimulation causes no reflex. When reading, she says, she has double vision, but there appears to be no palsy of the extraocular muscles. Fixing her eyes upon near objects causes a horizontal nystagmus. A functional test of the eyes developed multiple scotomata and contracted visual fields for red and green (see Plate I, chart 1). The inferior temporal quadrant of the left disc is markedly pale. Vision 20/30 in both eyes.

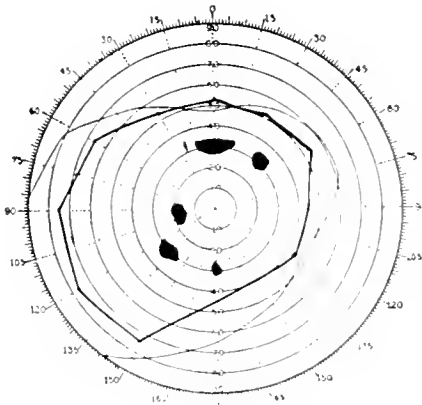
CASE No. 7.—A janitor, 42 years of age, has suffered for twelve years from general nervousness and weakness in the lower limbs. At the age of thirty he had typhoid fever which was an unusually severe attack with protracted convalescence. He states that he never regained his normal strength and dates his present trouble from that time. During childhood he had whooping cough, mumps and measles. Following the attack of measles, vision in his right eye was somewhat impaired, he did not fully regain vision. In the past two years he has had an unsteady gait, which is now shuffling and markedly spastic. He has an intention tremor of both hands. Tremor of the tongue and scanning speech. Muscular strength is diminished in all extremities. The tendon reflexes are exaggerated. Babinski toe reflex is present on both sides. Nystagmus is marked. Punctate choroidal changes in the fundus of both eyes. Vision O.D. 15/50; O.S. 15/30. Optic atrophy of the temporal half of the left disc, multiple scotomata (see Plate I, chart 3).

CASE No. 8.—A farmer, aged 40, has long suffered from occipital headache and dizziness. From his description it is apparent that he has suffered for years from typical migraine. He says that for two years the headaches have been more constant and are different in character, being more distinctly in the occipital region. The dizziness is more pronounced. He has some weakness in the lower extremities and is easily exhausted in walking. His arms become easily tired and he has a tremor of both hands. During the examination he appeared rather dull, although otherwise intelligent. The muscular strength was much diminished in the extremities. The patellar tendon reflexes were very much exaggerated and ankle clonus was present on the right side. The plantar reflex was not obtained on the right side. Babinski toe reflex on the left. He complains of disturbance of vision after reading for a short period. Horizontal nystagmus was present in both eyes. Vision 20/30 in both eyes. The papillo-macular region of the left disc was strikingly pale. The visual fields of both eyes were contracted and multiple scotomata were present (see Plate II, chart 7).

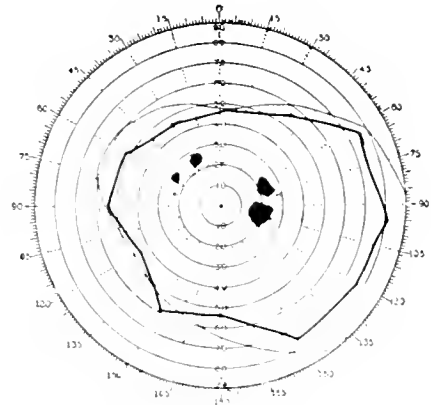
CASE No. 9.—A very nervous young woman, a teacher, 29 years of age, complained of blurring of vision, jerking of the eyes, headache, dizziness, weakness in the lower extremities and a tremor of both hands. She has not been well for many years and, as far as she knows, she has always been of a nervous temperament. At the age of four years she had a severe attack of scarlet fever, with acute nephritis. During convalescence she was quite deaf and had a speech defect but gradually recovered. Her present condition developed about four years ago. At this time she first noticed a stiffness and irregular pains in the lower extremities. She became easily fatigued, and finally gave up her school work. She was told by a number of physicians that her

PLATE II

CHART 5.

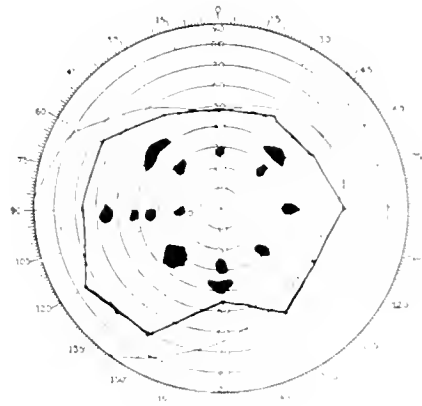


Left eye vision 20 30

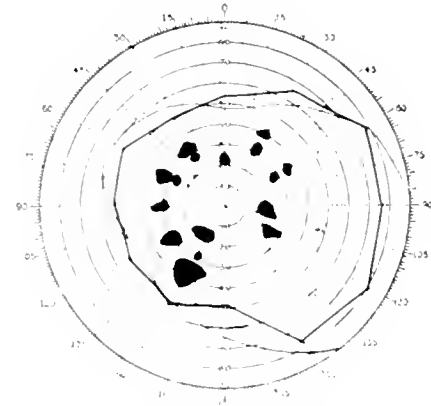


Right eye vision 20 30

CHART 6.

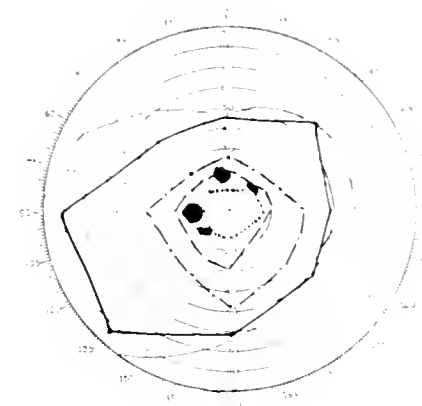


Left eye vision 10 40

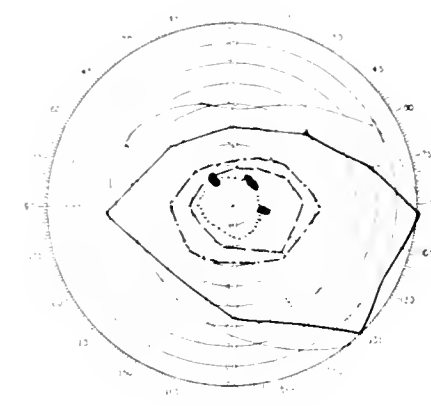


Right eye vision 10 40

CHART 7.

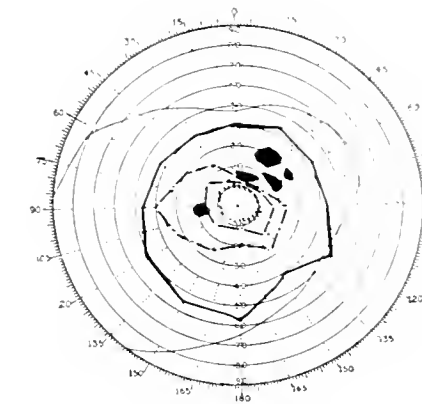


Left eye vision 20 30

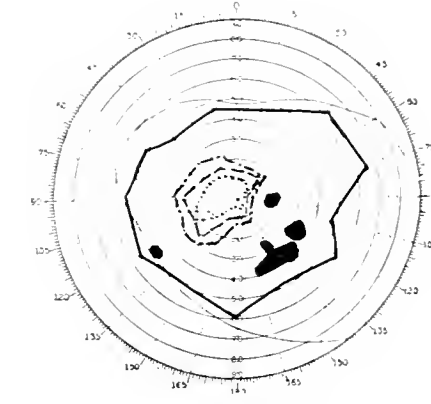


Right eye vision 20 30

CHART 8.



Left eye vision 20 100



Right eye vision 20 200

Field of vision ——— White - - - - - Blue - - - - - Green for 5 mm. □

condition was hysteria. At my first examination the patient presented the following symptoms: spasticity in the lower extremities; tremor of both hands, which was present only during muscular exertion; muscular strength diminished; horizontal nystagmus; scanning speech; exaggerated tendon reflexes; ankle clonus; and Babinski toe reflex on both sides. Her vision was 20/200 in the right eye and 20/100 in the left eye, which was but slightly improved by glasses. The visual fields were contracted. There were multiple scotomata (see Plate II, chart 8). Optic atrophy in both eyes.

CASE NO. 10.—A mechanic, 23 years old, complaining of staggering gait, marked weakness in the lower extremities, double vision and a tremor of both hands. His family history is good and he had always been well until he was eighteen years old. At this time he had a severe attack of typhoid fever. Convalescence was very protracted and he believes he never fully recovered. About one year later he first noticed a weakness in the lower extremities. The upper extremities were soon involved and a tremor occurred in both hands. A little later visual disturbances, increasing weakness in the legs, and staggering gait appeared. His gait is distinctly spastic, movements of the upper extremities bring on a marked intention tremor. Muscular strength is diminished. The tendon reflexes are exaggerated and the Babinski toe reflex is present on both sides. The speech is scanning. There is a paralysis of the left external rectus, and a marked horizontal nystagmus is present in both eyes. The visual fields are contracted and multiple scotomata are present (see Plate III, chart 9). Distinct paling of the disc in the papillo-macular region in both eyes. Vision O.D. 20/40; O.S. 20/40.

CASE NO. 11.—An American farmer, 44 years of age, of good habits. There is nothing of interest in the family history and he was well until the present trouble developed. About three years ago he became irritable and was easily exhausted. He complains of weakness in the legs. His arms are weak and he has a tremor of the hands. He suffers a great deal from frontal headache and at times has blurring of vision. The muscular strength is much diminished in both upper and lower extremities, with considerable rigidity in the legs. The gait is distinctly spastic and there is a shuffling of the right foot. Patellar tendon reflexes are increased. He has an ankle clonus on both sides and a Babinski toe reflex on the left. There is a horizontal nystagmus in both eyes. Vision O.D. 15/20; O.S. 15/20. The visual fields are contracted. Scotomata in the inferior temporal quadrant in the fundus of the left eye and optic atrophy in this region (see Plate III, chart 12.)

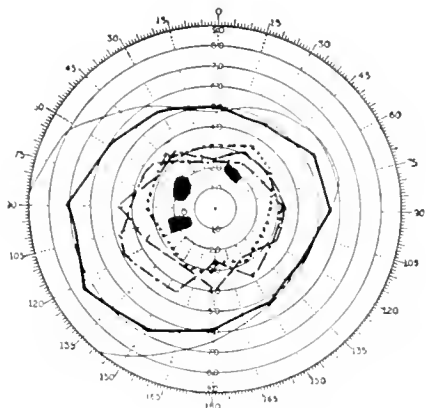
CASE NO. 12.—An engineer, 52 years of age, a man of good habits, was well until two years ago when he gradually developed a weakness of the lower extremities, dizziness, blurring of vision,

rigidity and tremor of both hands. At the time of the examination he had a marked spastic gait; intention tremor; tremor of the tongue, and tongue deviated to the right when protruded; and horizontal nystagmus in both eyes. The hearing was much impaired in both ears. He slurred his words at times. The tendon reflexes were much exaggerated. Babinski toe reflex was present on both sides. Vision O.D. 15/40; O.S. 15/40. The visual fields were contracted and there were multiple scotomata (see Plate I, chart 2). There is optic atrophy of the temporal halves of both discs.

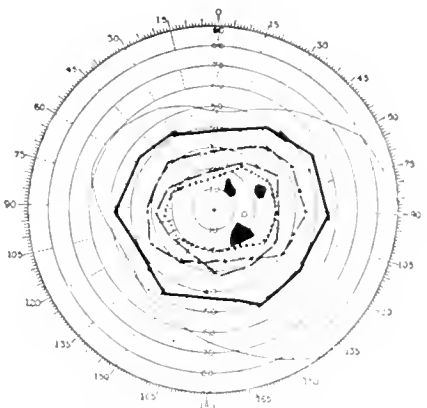
Summary of Symptoms.—In reviewing the symptoms presented by these patients, we find the most constant complaint is general nervousness. By this, the patients referred to a fine tremor or sensation of quivering in the hands and sometimes in the lower extremities, which preceded the coarse, intention tremor so characteristic of this disease. Cloudiness or blurring of vision and headache and dizziness were constant and early complaints. Then followed the weakness, usually in the lower extremities, and often with a feeling of general physical and mental exhaustion on slight muscular exertion, and a little later on, as in one of the cases preceding this, a weakness in the arms and hands. The deficiency in the muscular strength was demonstrated in all of the cases at the first examination. Two of the patients had suffered pain and insomnia for a long time. Irregular, wandering pain was one of the complaints in three of the cases. With reference to etiological factors in the cases examined, the most striking is the close association of the development of the disease with the acute infectious diseases. Two cases were preceded by an attack of measles; two by typhoid fever; and one by scarlet fever. In the other seven cases there is nothing in the family or personal history nor in the habits of the patient that might be regarded as a possible cause of the disease. As to the physical signs, those referring to disturbances of the eyes were the first subjective symptoms noticed by the patients, and a careful analysis of the history of the present ailment and result of the functional examination of the eyes, point to a momentary diminished visual acuity and insufficiencies of the eye muscles; all of the cases presented these symptoms, well developed, when first examined. An irregular contraction of the visual field, particularly for colors, was present in eleven cases; dyschromatopsia in four; one large unilateral scotoma in the region of the inferior temporal quadrant in one; and multiple paracentral

PLATE III

CHART 9.

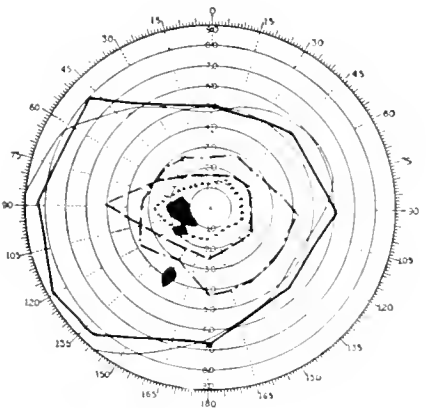


Left eye vision 20 40

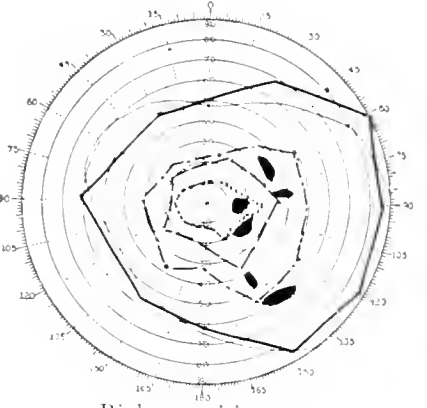


Right eye vision 20 40

CHART 10.

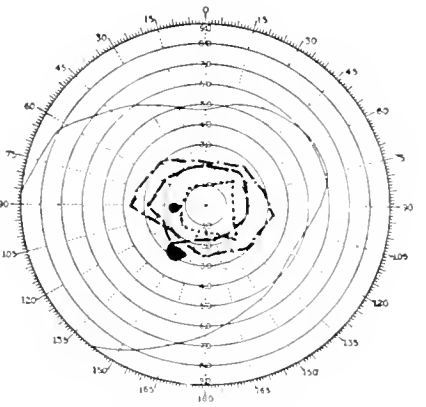


Left eye vision 15 30

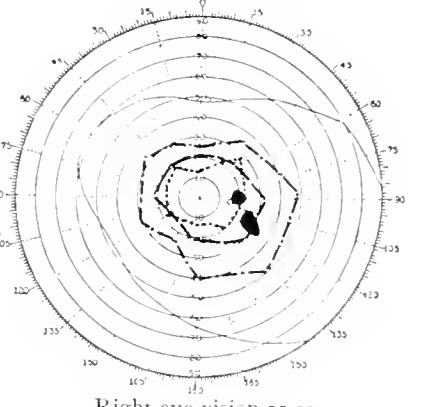


Right eye vision 15 30

CHART 11.

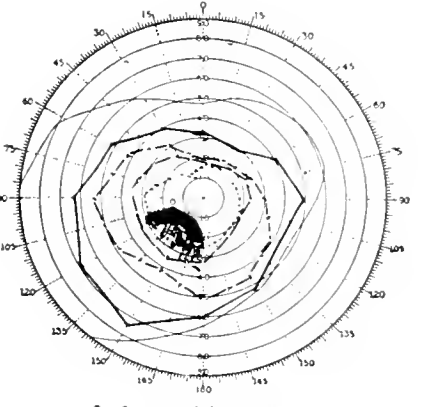


Left eye vision 15 20

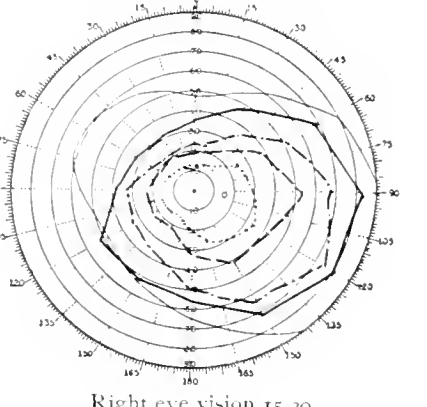


Right eye vision 15 20

CHART 12.



Left eye vision 15 20



Right eye vision 15 20

Field of vision——White -.-.-. Blue ---- Green for 5 mm. □

scotomata in eleven. In ten cases the visual fields of both eyes were thus involved. In two cases the scotomata were unilateral. In twenty-one of the twenty-four fields, the scotomata were in the temporal halves; in nine cases bilateral; in one unilateral temporal; in one inferior temporal and superior nasal quadrant; and in one bilateral, both temporal and nasal sides being involved. Optic atrophy in the inferior temporal quadrant was found in nine cases; in two of these cases only one eye was so involved. In spite of these findings the vision was remarkably good; eliminating errors of refraction, in ten cases it was not less than 20/40. Paralysis of the left external rectus occurred once; paralysis of the left internal rectus in another case. Double vision was spoken of in another case but no paralysis of the extraocular muscles could be demonstrated. An inequality of the pupils occurred in two cases. The time of the onset varied from five months to twelve years. The weakness in the extremities, particularly the lower, and a tremor of the hands were also early symptoms in all of the cases. Diminished muscular strength was invariably present and often very marked. The so-called intention tremor was demonstrated in nine patients. A marked spastic gait was present in seven cases; an ataxic gait in one; scanning speech in three; tremor of the tongue and motor paralysis of the tongue in two; impaired hearing in two. The tendon reflexes were increased in all the cases, with an ankle clonus in six. The Babinski toe reflex was observed ten times, in four cases it was unilateral, while plantar irritation produced no reflex on the opposite side. Two of the patients stated that, on several occasions, they had had incontinence of urine, which was only for short periods and was not present at the time of the examination. While the clinical diagnosis in this series of cases has not been proven by post-mortem examinations, the symptom-complex presented by these patients is positively that of an organic cerebro-spinal lesion. There are but one or two organic diseases that need be considered in the differential diagnosis. The most important is cerebro-spinal syphilis and possibly general paralysis and in the cases closely associated with acute infectious diseases, an encephalo-myelitis with a secondary reaction, gliosis. General paralysis could not have serious consideration in the present stage of the disease in any of my cases. On the other hand, the visual disturbances (mul-

multiple scotomata and well preserved visual acuity) are not characteristic of cerebrospinal syphilis. As to the neurological phenomena, we have one symptom which is pathognomonic per se of an organic cerebral or spinal lesion. The Babinski toe reflex, the absence of the normal plantar reflex on one side, with a Babinski toe reflex on the opposite side, is significant of asymmetrical development of the disease especially if the Babinski sign occurs later, on both sides. This also rules out hysteria. The association of the foregoing with a spastic gait, exaggerated tendon reflexes, intention tremor of the hands, scanning speech and nystagmus, leave little doubt as to the correct diagnosis.

Bruns claim that 32 per cent. of the cases of multiple sclerosis begin with visual disturbances. Ulthoff found the fundi normal in one hundred cases and no visual disturbances in 48 per cent. In all of the author's cases, visual disturbances were the first symptoms. When we consider that the optic nerves are affected so as to give a definite ophthalmoscopic picture in 45 per cent. of the cases; that nystagmus and nystagmoid movements are present in 70 per cent. to 80 per cent., we must admit that visual disturbances are much more common in multiple sclerosis than in any other disease of the nervous system, except cerebral tumor. While nystagmus is not the most important ocular sign, it is undoubtedly an early symptom in many cases and in part at least may be responsible for the earlier visual disturbances, such as blurring of vision when using the eyes for near work, probably due to inability to maintain a constant binocular visual field, from muscular insufficiencies due to defective innervation. While not sufficient to separate the visual field entirely with resulting double vision it is sufficient to cause indistinctness of the outline of objects. True nystagmus occurs in only about 15 per cent. of the cases. Nystagmoid movements in 61 per cent. True nystagmus is more significant in multiple sclerosis, as it is relatively more frequent in comparison with other cerebral lesions.

It is true that ophthalmoscopic changes surpass in diagnostic value all other eye symptoms or any other single symptom occurring in multiple sclerosis. However, it does not appear reasonable to regard this as one of the earliest signs. Secondary descending degeneration from a retro-bulbar lesion seldom occurs, and for this reason fundus changes sufficient to cause a perceptible change in the color of the disc to be observed by the ophthalmoscope must require a considerable lapse of time be-

tween the onset of the disease and the development of perceptible fundus changes. Marked optic atrophy occurs in about 3 per cent. of the cases; incomplete atrophy in 19 per cent.; temporal pallor of the disc in 18 per cent. It is noteworthy that the great majority of the cases from which these statistics are collected, are cases presenting other marked symptoms, others giving a history of physical, as well as mental, incapacity for years preceding these observations. Kampherstein found positive fundus changes in 70 per cent. of his cases. It is certain that ophthalmoscopic changes are more frequent in this disease when the condition is well developed than in tabes or general paralysis.

The appreciable changes in the ophthalmoscopic picture are almost wholly dependent upon differences in color of the fundus, either by changes in the circulation and its resulting conditions or differences in the density of the tissue. The former may develop rapidly but the latter, which is the case in multiple sclerosis, must of necessity occur gradually, especially in lesions lying some distance behind the bulb. The ophthalmoscopic findings are not in relation with the degree and form of the visual defect. In many cases ophthalmoscopic changes precede a visual disturbance, or vice versa. The former is evidence of a slow and incomplete degeneration of the nerve elements of the optic nerve. The latter is characteristic of a retro-bulbar lesion without secondary descending degeneration. Identical ophthalmoscopic pictures may be found in entirely different pathological processes and great variation in the same disease in the various stages.

In multiple sclerosis, where only the temporal half, and often only the inferior temporal quadrant, of the disc shows a paling, there may be involvement of the entire optic nerve, at least involving more than the papillo-macular bundle. It is one of the characteristics of the pathological process of multiple sclerosis, that there is only a slight tendency to a descending atrophy from the sclerotic plaque. While the atrophic paling of the disc in this disease is of great importance, we cannot draw any conclusions as to the extent, the degree and location of the disease process in the visual path, owing to the persistence of the axis cylinders. Visual fundus changes are undoubtedly due to changes in the interstitial tissue of the optic nerve immediately back of the bulb. Where the neuroglial mantle is strongly developed, this dwindles, posteriorly, to be again well developed in

the chiasma particularly at a point where both optic tracts fuse (Weigert's Kielstreifen) or in the internuclear and nerve fiber layers of the retina. Every lesion in the visual path between the bulb and external geniculate body (with the exception of sclerosis en plaques) will sooner or later cause a simple optic atrophy of the papilla by a degeneration toward the periphery and, as a rule, functional disturbances precede any ophthalmoscopic changes for a considerable time. This varies with the distance between the bulb and the lesion, and fully explains the conditions resulting in a temporary normal appearance of the papilla, with defective visual fields and diminished acuteness of vision. Uhthoff states that, as a rule, the retina does not present any changes in multiple sclerosis. He reports a case in which there were chorio-retinal changes. In two of the writer's cases (case no. 3 and case no. 4) this condition was quite marked. Visual disturbances and scotomata were, however, not in accord with the ophthalmoscopic findings (Plate 2, chart 6 and Plate 3, chart 11) also a temporary reddening of the disc, so frequently seen in the cases of retrobulbar neuritis, was observed in one of the cases (case no. 1, Plate 3, chart 10).

VISUAL DISTURBANCE CHARACTERISTIC OF CEREBRO-SPINAL SYPHILIS AND MULTIPLE SCLEROSIS.

While tabes dorsalis, general, paralysis and hysteria are excluded so far as differential diagnosis is concerned in the case reported in this paper, cerebrospinal syphilis must have serious consideration. Prolonged visual disturbances without ophthalmoscopic changes are extremely rare in cerebral syphilis, frequent in multiple sclerosis. Unilateral appearance of visual disturbances is common to both cerebral syphilis and sclerosis en plaques. Unilateral central, definitely circumscribed scotoma, with a normal field of vision in the opposite eye, is most likely to be due to syphilitic disease, it is always due to organic disease. Papillitis almost never occurs in multiple sclerosis, although hyperemia of the papilla at the beginning of sclerosis en plaques is not unusual, it is present in 14 per cent. of the cases of cerebral syphilis. An absolute central scotoma is relatively rare in multiple sclerosis, frequent in neuritis axialoris.

A central scotoma is not infrequent in both acquired and congenital syphilitic disease of the central nervous system. A

unilateral, paracentral scotoma is indicative of a lesion in the optic nerve in the neighborhood of the fovial fibers and is most frequent in syphilis.

Visual disturbances without ophthalmoscopic changes almost never occur in organic lesions of the opticus; and in most chronic diseases of the optic nerve and chiasma, the fundus, the visual field and central visual acuity are abnormal, except in sclerosis en plaques where negative ophthalmoscopic findings are frequently associated with abnormal visual field and normal central and peripheral visual acuity. Scotomata due to functional nervous disease are relative, never absolute. Hysterical scotomata are so infrequent that they should always suggest organic disease.

The charts of the visual fields in ten cases show bilateral paracentral absolute scotomata in the temporal portion of the field which is indicative of a lesion in the chiasma at the point where the bundles of the papillo-macular region cross each other under the floor of the recessus of the third ventricle. The central visual acuity is little or not at all disturbed. The ophthalmoscopic findings have no relation to the scotomata with reference to location and visual acuity. Visual fields for white are slightly or not at all contracted, color fields (for red and green) more so, dyschromatopsia in one case.

In true multiple sclerosis early in the disease the most frequent symptom complex referred to the vision is: blurring or cloudiness of vision, negative ophthalmoscopic findings, absolute paracentral scotomata, normal peripheral field with little or no disturbance of central visual acuity. This combination is indicative of multiple sclerosis and when associated with exaggerated tendon reflexes is sufficient to establish this diagnosis. If the scotomata are but relative, hysteria would still be a possibility. If, however, the Babinski toe reflex is present on one or both sides, it can be positively eliminated. While twelve cases are not sufficient in number to establish these definite facts, the writer has taken into consideration statistics gathered by Wilbrandt and Sanger, Uhthoff, Posey and Spiller, Edward Muller and others in reaching this conclusion.

AMYOTONIA CONGENITA: REPORT OF A CASE

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The still limited number of cases of this condition recorded in literature seems to justify detailed report of yet another case. Collier and Wilson¹ have in a comprehensive way reviewed the literature and summarized the views of various observers relative to the claims of Oppenheim's disease to be regarded as a clinical entity. The weight of opinion is distinctly in favor of Oppenheim's original contention that the condition is something apart from the myopathies, with which some formerly thought it might prove identical. Collier and Holmes² have more recently adduced further proof in support of this distinction, and furnished reports on the pathological findings in two additional cases. Indeed our knowledge of amyotonia congenita has now seemingly reached a point to justify us in regarding it as a condition peculiar and apart—a developmental error or disease limited to the lower motor neurone and its muscle. Spiller,³ Bing⁴ and Boudouin⁵ had prior to the article of Collier and Holmes reported on the pathological changes found by them in amyotonia congenita. Spiller saw only degeneration of muscle fibers and there was alteration of the thyroid and thymus. He found no changes in the nerve tissues. His examination was done post mortem, and was general. Spiller further made the interesting observation that no post-mortem rigidity had taken place in the body after twenty-two hours. Bing's examination was limited to a piece of muscle excised from the living subject, and his findings were indicative of slight regressive changes in that tissue. Boudouin made a detailed post-mortem examination of a case and found intense regressive and sclerotic changes in the muscles, diminution in number of ventral horn cells of the cord, destruction or lack of development of fibers in the peripheral nerves, and sclerosis of the thyroid and thymus. Collier and Holmes examined excised muscle from a living case, and had post-mortem examination of another. The changes observed in the muscle tissue by these authors were in keeping with those of the three

previous writers, more especially Baudouin. A peculiarity of the muscle changes was the presence of enlarged muscle fibers, with diminution in the number of nuclei and disorganization of the substance in fibers so affected. These were regarded as undergoing degeneration preceding atrophy. Atrophied fibers and the presence of excessive quantities of fibrous and fatty tissue were further seen in the muscle body. Their findings in the ventral horns and nerve trunks corresponded to those of Baudouin. They say nothing of the condition of thymus and thyroid in their case with necropsy.

Some difficulty has been encountered in an endeavor to reconcile the pathology as we know it at present with the clinical course of the disease. For, while competent observers (Beever,⁶ Collier and Wilson,¹ Holmes²) have cited instances in which great improvement and even complete recovery have occurred, the pathological findings suggest a regressive condition, which presumably would not admit of the improvement and recovery seen in such cases.

No serious attempt has been made to explain the possible relation of changes in the thymus and thyroid to the condition proper, other than the suggestion that the disease may be caused by failure of some internal secretion.

In the cases recorded in the literature, there is a notable absence of any similar disease in the relatives, or any dyscrasia in the parents that might have influenced the vital impetus imparted to the affected child, or as for that, any familial tendency whatever. Sylvestri⁷ and Sorgente⁸ reported cases in which exceptions to this rule seemed to obtain, but the diagnoses in their cases were questionable. In my case a maternal aunt suffered from osteomalacia, but this was probably adventitious and provoked by early child bearing.

The distinct improvement in the case here presented seems to further entitle it to notice.

Rosenburg⁹ and Cattaneo¹⁰ referred to the fact that in some instances no quickening was felt by the mother. I questioned closely the mother of the child I examined, and she assured me that she felt no movements in utero.

The data in my case were as follows: T. S., aged 3 years, white male, first seen by me April 9, 1909. Family history is to the effect that the father died at the age of 34, presumably of typhoid fever. Mother is living and well. The parents are

Syrians of better class. A sister of the child's mother suffered from osteomalacia, having borne a child at 13½ years of age, under the oriental marriage custom. Aside from this the mother is sure that no one related to her or her husband suffered from any nervous trouble or chronic ailment. The patient is the only child, the mother having had no other pregnancies.

Personal history is to the effect that birth was natural at full term, labor terminating after approximately eight hours. The mother claims that the child has never been ill in any way whatever since birth, nor has it been injured. Patient was breast fed and was always robust. Began talking between eleventh and thirteenth months, and has seemingly always been bright mentally. According to the mother's statements the child has never been able to maintain a standing position, neither was he, when younger, able to crawl or move himself otherwise than by rolling over. Mother says that she remembers noticing that the child was always very quiet and she never knew him to kick or make resistance with the legs when being dressed. She says however that he has moved his upper extremities normally. The sole complaint for which the child is brought for consultation is its inability to stand or walk.

On inspection of the child stripped, it is observed that the spine arches forward and the body bunches ventrally. If tired or if careless in its efforts, the head falls forward or in whatever direction gravity dictates. The kyphosis of the spine readily disappears when the child is lifted by the shoulders; and the extremities dangle loosely about. The child is rather large in frame and no suggestion of bone disease is at all apparent; seems well nourished, weight 38 lbs. The head is normal in size and well proportioned. Child seems unusually bright and apt for its age. Next to the obvious weakness causing the child to assume the above mentioned attitudes when sitting, what most attracts attention is the legs which seem rather too slim for the body. There is no local wasting or difference in the size of the two legs, but the slinness of the extremities is obviously more pronounced in the legs than in the thighs. The child is unable to support the weight of the body on its legs, but when lying on its back can move its legs in various directions when not resisted. It cannot however raise the whole lower limb with the leg extended on the thigh more than a few inches, and then only for a brief interval. Notwithstanding the mother's statement that the upper extremities were all right, it was found that the arms and hands were likewise quite weak, though not at all to the same degree as the lower limbs. The arms are apparently normal in size and proportion. Voluntary power in the neck muscles is also recognized as reduced. The weakness in the musculature is symmetrical on the two sides of the body, nor does any muscle or muscle group seem to be involved in a predominate way. The joint play is noticed to be too free: it is possible to put the thighs

flat against the abdomen, to put the soles of the feet together behind the head, to overflex the hands and feet, to cross the arms behind the back. The mother had noticed this and stated that the child had always been "loose jointed." The weakness and other involvement of the musculature appear to be more pronounced towards the peripheral end of the extremities. On palpation, the skin, subcutaneous tissue, and muscles, impart a homogeneous sensation, and it is difficult to detect the body of the muscles through the skin. The muscles seem toneless and do not resist being lifted somewhat from their positions. No sensory disturbances of any kind were detected, though sensation could not be tested with great certainty on account of the child's age. Pupils equal, round, active to light and accommodation. The cranial nerves were all apparently normal. The fundi of the eye were likewise normal. No trouble with swallowing, or with the sphincters, and articulation is perfect. The deep reflexes are everywhere absent; superficial reflexes normal. On proceeding to make electrical tests of the muscles of the extremities, it was noticed that reaction to galvanism was slightly diminished, though the polar formula was normal. However, with the faradic current only a moderate contracture could be gotten with the very strongest current to be had from a wall plate, and the child seemed to experience no pain or discomfort whatever therefrom. There were no contractures.

The child was at this time under my observation two weeks, during which no appreciable change was noticeable.

The patient was next seen by me on October 27 of the same year, having been admitted to the children's ward of the Charity Hospital. The condition had improved slightly since first observation. Aside from this, nothing new was observed. Remained in the hospital service for 20 days.

Child was again seen by me on February 5, 1910, when the muscular power was observed to be definitely better than on first observation. The child when coaxed could be gotten to stand when holding to an object. The results of a final examination were aside from susceptible increase in the muscle power, and an apparent better tone of the musculature, quite the same as on first observation. The child's weight had increased to 45 lbs. and the general condition was splendid.

During this time treatment by means of faradic current to the affected muscles, and strychnin, were given.

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SOME OF THE DIFFICULTIES ENCOUNTERED IN MAKING A DIAGNOSIS OF PARESIS

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The three following cases which recently came to autopsy are, in view of the recent advances made to further the diagnosis of paresis, of special interest. The brain in paresis until recently has been looked upon as presenting a uniform characteristic picture. We are familiar with the thickened and edematous pia, whitish and translucent along the vessels, and especially over the vertex of the frontal and parietal lobes; the increased size of the Pacchionian granulations; the atrophy of the convolutions, especially of the frontal lobes and to a less extent, in the central convolutions; the narrow cortex which is often adherent to the pia and tears upon its removal (decortication); the dilated ventricles; the ependymitis, especially of the fourth ventricle and the inner walls of the lateral ventricles. The weight of the brain regularly below the normal.

Cases coming to autopsy and presenting the foregoing picture are easily diagnosed and can be called paresis without fear of contradiction. However, of late, we are recognizing the fact that we are having cases which present typical clinical histories of paresis, and also some which are atypical, which at autopsy show but few of the appearances enumerated, and some show practically nothing macroscopically by which a diagnosis of paresis could be made. This is apparent in the three cases which will be presented. By lumbar puncture and the cytological examination of the cerebrospinal fluid, we are now able to say from the presence of plasma cells, that we are most probably dealing with paresis. This, however, is not absolutely so, as there are cases reported of trypanosomiasis, tubercular meningitis, meningo-myelitis, tabes dorsalis, etc., in which plasma cells have been found.

In one of my cases (Case no. 2) in which there was a cyto-

logical examination of the cerebrospinal fluid, the findings were positive.

Case No. 3 was dubious. While there was an increase of cells, there were no typical forms of plasma cells. None of the cases could be called paresis from the macroscopical appearances. Examined histologically, they all presented unmistakable evidences of paresis.

The first case, W. B., colored male, age sixty (?) years, admitted September 1, 1908; occupation, laborer. No definite or reliable family or previous history could be obtained from the patient, owing to his demented condition. His statements were so rambling and incoherent that this part of the examination was given up. The medical certificate received on admission gave the following information: Nothing known as regards nervous or mental disease in the antecedents. Patient states he used alcohol to excess. Not known if he had epilepsy, apoplexy, syphilis or other serious physical disease. No history of mental symptoms prior to August 8, 1908. Symptoms of insanity—disoriented for time, place and person; childish actions; tries to run away; very talkative; auditory hallucinations; delusions; says he is building a row of houses near the hospital. He is troublesome; attempts to remove the screens and sashes from the windows; is noisy, and disturbs other patients. He accuses people of jumping on his body and tramping on his feet, when no one is near. He talks a great deal about going to work, and that he has been working down at the wharf, when he has not been away from the hospital.

When admitted patient showed good development and nutrition; face wrinkled, and expression blank; hair mostly gray; some puffing of the eye-lids; lower lip redundant; gait was slow and unsteady; shoulders stooped, and the body bent forward; some dark-colored scars on the face and extremities, suggestive of lues. Circulatory system: Heart action regular; no murmurs; pulse fifty-six standing, increased tension; temporal vessels are visible, tortuous, and somewhat atheromatous; the radials are atheromatous; varicose veins of both legs. Muscular system: Fairly well preserved; tone diminished; fair amount of adipose tissue present; no distinct pareses noted. Urinalysis showed a trace of albumin; no casts. Nervous system: No pain complained of; no areas of tenderness noted; some fine tremors of the fingers; coördination impaired; some swaying of the body with eyes closed and heels together; does poorly in attempting to touch the nose with index finger of each hand with eyes closed; unable to balance himself when standing on either foot; grip diminished on both sides, but not markedly. Examination for cutaneous sensibility, unsatisfactory. Wrist,

elbow, and the patellar reflexes are all increased; abdominal and cremasteric not elicited; plantar normal; pupils equal in size, regular in outline; react promptly to light and accommodation; consensual present; vision impaired; beginning arcus senilis in both eyes; audition is good; speech somewhat drawling in character; unable to get his coöperation in repeating test phrases. No tremors about lips or facial muscles either in talking or showing the teeth. Tongue protruded in median line; some fine tremor noted along the edges. At times there is a coarse tremor of the head. Facial expression one of dementia; appears confused.

Shortly after his admission to the ward, he became much excited, talked in a rambling and incoherent manner, and wandered aimlessly about, knocking at the doors and windows, trying to get out. Consciousness was greatly clouded, and he was completely disoriented; could not tell the nature of the place he was in, how long he had been here, nor who brought him; could not give the year, month, day of the week, or date correctly. The attention could not be held, and he comprehended poorly. In speaking of his past life, he would try to recall some events, but would not get very far when he would lose himself and talk of something entirely foreign. His conversation on the whole was mostly incoherent and irrelevant. Memory almost nil for recent and remote events. No definite hallucinations nor delusions could be elicited, but the nurse states that at times he would say he did not want to stay here as "he had plenty of money." Emotionally he is dull, and has no appreciation of his deplorable condition. At times he displays some irritability, and is inclined to be obstinate. No vicious or dangerous tendencies have been observed. He spends the greater part of his time in wandering restlessly and aimlessly about the ward, talking to himself and frequently asking senseless questions. He is careless and slovenly in appearance, but fairly tidy in habits. May 15, 1909, patient is noted as becoming more feeble and demented; has some difficulty in getting about; usually sits quietly on the ward, and has nothing to say to any one; very untidy in his dress and habits; frequently goes to bed in the day time, thinking it is night; losing in weight. September 7, 1909. Removed to hospital ward and placed in bed, on account of weak and feeble condition. Has declined perceptibly during the past few months. Of late he has had considerable difficulty in getting about and has appeared quite nervous. He has been very restless and confused, both day and night, and has frequently insisted on going out to shuck oysters, and doing other work; unable to answer questions intelligently. October 6, 1909. At noon was found in a semi-conscious state; could only be aroused by shouting; respirations somewhat jerky and blowing in character. The appearance was suggestive of either an epileptiform or apoplecti-

form seizure. No convulsive movements or twitching noted; left leg and arm limp; right arm and leg showed some resistance on movement, patellar and plantar reflexes exaggerated, more marked on the right side. October 7, 1909. Continues in a semi-conscious state; temperature 99; muscles of the left side of face, arm and hand, twitching. October 8, 1909. Regained consciousness. Still has occasional twitching of the left side of the face. Temperature normal. Following the above note, patient's condition fluctuated considerably. At times he appeared somewhat better, and then again he would become stuporous. He ran an irregular intermittent temperature, and had occasional profuse sweats. On November 1 lapsed into a semi-conscious state again; this gradually deepened and he expired, November 3, 1909, at 4:15 a. m.

An examination of the cerebrospinal fluid was not made in this case. The clinical diagnosis was arteriosclerotic dementia, although paresis was considered. This diagnosis was based on the patient's age, the presence of arteriosclerosis, the pronounced dementia, and the subsequent epileptiform or apoplectiform seizures. There were no pupillary disturbances noted and the speech defect was not characteristic.

Post mortem findings: Cranium—skull rather thick and very dense, the diploë being very scanty. Tables thick. Dura non-adherent and normal.

Brain: Weight 1,390 gms. The arteries at the base were sclerotic and dilated and curved, but not calcareous. No anomalies were present. Section of the brain revealed no gross lesions of the brain substance. The ventricles were moderately enlarged, lining smooth. The perivascular spaces were unusually large and apparently numerous, giving in some places a cribriform appearance to the section. The brain substance was soft and edematous.

The histological examination of the cortex in two different regions, made by Dr. N. Achucarro, shows the essential elements found ordinarily in general paralysis. The vessels are infiltrated with abundant plasma cells. This infiltration is found in most of the cortical vessels. Besides plasma cells there are some lymphocytic elements, and a few granular cells in the infiltrations. Rod cells are numerous in the cortex, many of them corresponding to the typical needle-like forms. The neuroglia cells are more numerous than in the normal. Frontal and precentral regions and Ammon's horn examined. A second examination affirms still more positively the diagnosis of general paralysis.

In view of the findings, a review of the clinical history of the case shows nothing which is inconsistent with paresis, which diagnosis was considered ante mortem. In fact, the rapid course of the disease with its symptomatology, to my mind, favors this diagnosis. Had an examination of the cerebrospinal fluid been

made, in all probability we would have obtained additional evidence pointing to paresis.

SECOND CASE. T. S. Colored male; age 33 years (?); harness cleaner; admitted January 7, 1909. Owing to the demented condition of patient, no reliable information as regards the family or previous history is obtainable. Admits having syphilis. Denies the excessive use of alcoholics in recent years. Medical certificate received on admission states that patient claims he has not drunk for years. Was formerly of good temper but now irritable; has had syphilis for years, and shows evidences of syphilitic ulcers: Symptoms of disease first became manifest by gradual impairment of mental faculties; talking to himself, and holding arguments with imaginary persons, and inability to properly perform his work. This condition has been apparent for one year past. Present symptoms of insanity: Mental confusion; hallucinations of hearing and loss of memory. For years has been working about stables, but for past year has been unable to properly assort harness. At times he believes that electricity interferes with his mind.

A friend states that for more than a year patient was noticed to be changing; became irritable without cause; was unable to apply himself to his work as formerly; was forgetful and at times seemed confused and talked in a flighty manner. Lately had wandered aimlessly about, frequently talked to himself, and carried on conversations with imaginary persons.

On commitment, patient showed good development and nutrition. Features African type; lower lip very redundant, especially on right side. Right naso-labial fold more pronounced than the left. Attitude stooped; gait markedly ataxic. Skin in good condition. Leutic scars on body and extremities. Glandular system: Post-cervical, epitrochlears and inguinals enlarged. Respiratory, circulatory, digestive and genito-urinary systems apparently normal. Nervous system: has fronto-parietal headaches at times. No areas of tenderness. Tremors of the muscles about the angle of the mouth and extended fingers; fibrillary tremor of tongue; twitching of the various muscle groups noted in extremities. Coördination impaired. Some swaying of the body in standing with heels together and eyes closed. In touching tip of the nose with index fingers and bringing tips of fingers together with eyes closed, there is a very perceptible degree of incoördination observed. Balancing power on one foot very poor. Grip weak for muscular development. Examination for disturbances of cutaneous sensibility unsatisfactory. Patient coöperated poorly. Patellar reflexes almost abolished. Plantar and cremasteric diminished. Pupils unequal, right larger than the left; regular in outline; react sluggishly to direct light, and consensual tests; accommodation and sympathetic, normal; vision impaired. Hearing apparently normal. Speech ataxic. Unable

to say test phrases; syllables are poorly united and there is the characteristic slurring. In attempting to write, tremor of fingers is more pronounced, and his writing, which is unintelligible, shows the characteristic irregularities caused by the tremor. Facial expression somewhat demented. Attention only maintained with effort. Consciousness is clouded and there is considerable mental torpor. Some simple questions are answered correctly but he has no clear idea where he is, how long he has been here, nor can he tell the nature of the institution. He says this is a large hotel; that he has been here three months; that this is February 13, 1889 (January 9, 1909). He has a profound defect of memory, especially for recent events. He could not remember the number nine five minutes later; could not tell what he had for breakfast, and could not recollect any of the names of the people on his ward. He gives some of the events of his early life, but undoubtedly most of these are incorrect, as he frequently contradicts himself; lacks insight; says there is nothing the matter with him, and that he never felt better in his life. He is quiet and orderly; slovenly in appearance but tidy in habits. January 16, 1909. Severe epileptiform convulsion this a. m., lasting several minutes. Convulsion began with the head turning to the left; twitching of the muscles of the left side of face, soon followed by arm and leg in succession and involvement of the entire left side. Complete loss of consciousness lasting about fifteen minutes. January 18th: Mild epileptiform convulsion, more marked on the right side. Regained consciousness in a few minutes. April 11, 1909. While out walking had to be brought in on account of limbs giving away. Gait has become more ataxic, and Romberg sign is present. Tremors of fingers, muscles about angles of mouth and tongue are all pronounced. Both knee jerks absent. Speech defect much more pronounced. Stumbles over all test phrases. Of late his emotional tone has been variable. At times he has been quite irritable and obstinate. At present appears dull and apathetic, and has become very careless of his personal appearance. May 27, 1909. Had a very severe general epileptiform convulsion; unconscious ten minutes. July 23. Lumbar puncture by Dr. Hough. Fluid clear; pressure not increased; positive Noguchi test; cells per cubic mm. 90. Differential count, lymphocytes 78.25 per cent.; phagocytes 10 per cent.; polymorphonuclears .5 per cent.; plasma cells 9 per cent.; endothelial cells .25 per cent.; macrophages 1 per cent.; Körnchenzellen 1 per cent. These findings indicate paresis. August 27. Put to bed on account of feeble condition. Greatly confused; pulls at the bed clothing, and is very restless; later became stuporous and refused to take nourishment; temperature 100°; bladder distended; had to be catheterized. October 1. Shows considerable mental and physical enfeeblement; remains confined to bed; is

still confused and often becomes disturbed and noisy. He does not comprehend what is said to him and his conversation is incoherent and irrelevant; untidy in habits. November 1. Patient is bed-ridden; unable to walk or stand unassisted. Very much confused, and cannot answer questions intelligently. At times he is restless and disturbed; is losing flesh rapidly; has to be spoon-fed; filthy in habits. Expired November 23, 1909, at 10 p. m. Clinical diagnosis, paresis.

Post-mortem findings: Cranium—skull thick and dense; shape symmetrical.

Brain: Weight 1,200 grms. Cerebrospinal fluid increased. Shrinkage of brain over convexity and at the entrance of Sylvian fissures. The sulci are widened, and the pia-arachnoid edematous and opaque over the principal sulci and along some of the larger veins. The arteries at the base show some faint patches of opacity but are not calcareous. The ventricles are slightly dilated and there is a slight granular ependymitis. On removal of the pia on one hemisphere, no adhesions or decortications are found. The post-mortem findings are not conclusive as regards paresis.

The histological examination shows a typical picture of general paralysis. The cerebral cortex shows a very diffuse character of the process. Vessels infiltrated with plasma cells. Numerous rod cells; some *Körnchenzellen*. Considerable destruction of ganglion cells; great neuroglia proliferation. Frontal, precentral and calcarine convolutions, cerebellum and pons examined. In the cerebellum the number of destroyed Purkinje cells is not great but the pia shows an infiltration with plasma cells; some of the vessels in the tissue are also infiltrated in the same way.

CASE 3. G. D. Colored male; age 51 years (?); occupation laborer; admitted October 22, 1909. No reliable or definite information as regards family or previous history could be obtained from patient, owing to his demented condition. Subsequently, the following information was received from a sister: Symptoms were first noted in August, 1909. He became irritable and fault-finding. Would come into the house complaining of "niggers" following him and trying to kill him. Was very apprehensive. Would often approach the house on the run and jump over the back fence. In September he jumped into the canal to get out of the way of his imaginary pursuers. Would get up in the night and wander about the house, ransacking drawers and cupboards. Became very ugly towards members of his family. Memory became very poor, was frequently brought home from his work. The medical certificate received on admission, states that the patient denies the use of alcoholics, then again says he drinks. No history can be obtained previous to his admission to the Washington Asylum Hospital. Patient

says he hears the voice of the Lord talking to him, and claims to be able to answer him ordinarily. Has no idea who is President of the United States. Says his bed is full of grease, and that he slides out of it. Physical examination: Body fairly well developed and nourished. Old scars on back, hips and legs, suggestive of previous leptic infection. Scar from bubo in right inguinal region. Epitrochlears enlarged. Cardiac sounds roughened; no distinct murmurs heard; arteries atheromatous; veins over abdomen prominent. Nervous system: Indefinite pains in the abdomen; marked tremors of the protruded tongue, facial muscles, and extended fingers; attitude, stooped; gait unsteady—ataxic; coördination and balancing power impaired; patellar reflexes equal and about normal; plantar and defense reaction absent; marked speech defect; unable to repeat test phrases; handwriting shows the characteristic irregularities of the parietic; pupils equal and contracted—Argyll-Robertson pupils; annular arcus senilis in both eyes. Patient is disoriented to time, place and person, and appears markedly demented. Obeys simple commands slowly and awkwardly. Answers questions with hesitation, displaying little interest; usually replies "I don't know, sir." Says he hears the voice of the Lord talking to him, telling him to be a good man.

November 2. Becoming more unsteady and ataxic in gait. Muscular tremors more pronounced about the face when talking. Speech slurring in character; unable to repeat test phrases; very much demented; completely disoriented, and his memory is practically nil; cannot answer the simplest questions intelligently. He is very nervous and restless, and continually disarranges his bedding. He is very much confused, and often talks to himself. Frequently reaches out of the bed and picks up imaginary things on the floor. Occasionally can be seen going through movements as though winding a string about his hands. Very careless of his appearance and untidy in habits.

December 1. Growing progressively worse. He is emaciated, and on account of his restless condition is kept in bed with difficulty. He is confused, very irritable, and at times quite disturbed and noisy; has to be spoon-fed; is filthy in habits. The picture is one of profound dementia.

January 3, 1910. Becoming more feeble and demented; is bed-ridden and totally helpless; spoon-fed; bed-sores appearing over trochanters; continues restless and confused, often disturbed and noisy; conversation incoherent; speech markedly ataxic.

January 6. Neurological examination: Some beginning contractures noted in both lower extremities—legs on thighs; thighs on trunk; limbs can be partially straightened out but offer considerable resistance; flexions more marked on the left side; muscular resistance more marked on the right side. Muscular twitchings also noted in lower extremities. Fine tremors of

tongue and about angles of the mouth. Patellar reflexes not elicited; plantar present on the right side; absent on the left. No Babinski. Face expressionless. Does not respond to questions. When spoken to sharply, tremors and muscular twitchings become exaggerated. Extensive bed-sores over sacrum and trochanters. Urine cloudy and offensive (cystitis). Has an irregular temperature.

January 14. Lumbar puncture by Dr. N. Achucarro. The cerebrospinal fluid showed very faint Nonne Apelt globulin reaction. Very small amount of albumins coagulated by alcohol. The Alzheimer method showed increase in the total number of cell elements, mostly lymphocytes with some phagocytes. No typical plasma cells could be detected.

January 15, 1910. Expired at 3:20 p. m. Clinical diagnosis—paresis.

Post-mortem findings: Skull symmetrical and of usual thickness. Small depression on the right side of skull, corresponding with a scar.

Brain: Weight 1,440 grms. Dura shows pachymeningitis, localized over region of softening and atrophy on the temporal lobe; otherwise the dura is normal. Pia shows a slight opacity, and a moderate degree of shrinkage over the convexity. There is a small number of superficial cortical softenings over the right temporal lobe which do not correspond with the arterial supply. On section the brain showed no ependymitis. There was dilatation of the lateral ventricles; also dilatation of the perivascular spaces. Ventricular horns dilated with compensatory atrophy of temporal lobes due to the dilatation of the descending horns of the ventricles. There are no central softenings, and no gross lesions of the basal ganglia. Ammon's horns very much injected. Both kidneys show pus deposits (pyelonephritis). Bladder shows cystitis. Diagnosis of paresis not confirmed macroscopically.

Histological examination by Dr. N. Achucarro: Several convolutions examined from precentral and frontal regions, showed a typical histological picture of paresis. Diffuse infiltration of the perivascular spaces, consisting largely of plasma cells. Numerous Stäbschenzellen were found in every section examined. Nervous elements greatly impaired. Marked neuroglia proliferation. An examination of the superficial softenings of the temporal lobe shows them to be luetic, so that we have here paresis combined with cerebral syphilis.

The last case is of much interest in so far as in the examination of the cerebrospinal fluid, no typical forms of plasma cells could be detected, which one would ordinarily expect to see in view of the histological findings. As an explanation of this, the following may be offered:

In paresis we are dealing with a disease process, a meningo-encephalitis, in which as a rule the meninges are very much involved but occasionally the involvement of the meninges is not very great and but little can be observed macroscopically. In these cases the encephalitis is most marked. I believe the meninges are more or less involved in all cases of paresis, but that primarily the disease is more an encephalitis, the meninges being involved to a great extent secondarily. The cytological examination of the cerebrospinal fluid gives an account rather of the conditions in the meninges than of the pathological conditions in the brain tissue itself, unless we can exclude certain elements found in the fluid as coming from the brain tissue. So it is very easy to understand how the cytological examination in some cases cannot give a complete picture of the inflammatory process in the brain itself; for example, the plasma cells which are so numerous in the perivascular infiltration in the cortex are found proportionately in larger numbers even in typical cases of paresis with marked involvement of the pia, while the cerebrospinal fluid shows a proportionately larger number of lymphocytic elements. The increase in cells, including plasma cells in the cerebrospinal fluid, comes largely from the involved meninges. Now, if there is little involvement of the pia in the inflammatory process, there will be few cells in the fluid. In all probability some of the plasma cells enter the cerebrospinal fluid from the cortex through the lymphatic channels, but the large numbers do not appear until after the meninges are involved, when the pia becomes thickened, opaque and edematous. I believe we can have the plasma cells in the brain tissue with little or apparently no involvement of the meninges, and in this case the cyto-diagnosis of the cerebrospinal fluid would not be specific.

In conclusion, I wish to say that in all cases presenting clinical evidences of paresis, and in all cases where there is an element of doubt as regards diagnosis, a cytological and chemical examination of the cerebrospinal fluid should be made. Also, an examination of the blood and cerebrospinal fluid for the Wassermann reaction should be made in all cases, as a positive reaction is reported in over 98 per cent. of the cases by some observers. Further, all cases of paresis, or suspected paresis coming to autopsy, should be studied histologically, as the three foregoing

cases show conclusively that the brain does not always present the typical picture described when viewed with the naked eye.

Paresis is a diffuse process, and all parts of the cortex are more or less involved, presenting an infiltration which presents numerous plasma cells. This differentiates it from other meningo-encephalides which are more focal in character.

Since this article was read Dr. Wm. H. Hough, clinical pathologist, has made an examination of all the paretics in the hospital, using the Wassermann complement fixation reaction, and in every case obtained a positive reaction. From this fact I think we can say almost positively that with a negative reaction we can exclude paresis. I believe now that given the clinical history with the cytological and chemical findings of the cerebrospinal fluid, and the result of a Wassermann complement fixation reaction of the blood and cerebrospinal fluid, we can say positively whether we are dealing with paresis or not.

Society Proceedings

AMERICAN NEUROLOGICAL ASSOCIATION

(Continued from page 642)

CONTINUATION OF DISCUSSION ON DR. HAMMOND'S PAPER; "A NEW TYPE OF PRESSURE MYELITIS"*

Dr. Hammond said in regard to the case to which Dr. Sachs had referred, there was no doubt that it was one of spondylose rhizomelique; the muscle changes were those that are seen in this disease. Ankylosis of the hip joint or atrophy had not occurred in any of Dr. Hammond's cases. The rigidity was more a spasticity, as is seen in degeneration of the pyramidal tract, associated with ankle clonus, and Babinski reflex. He agreed with Dr. McCarthy that the bone changes were secondary. In all his cases the first symptom had been the curvature and rigidity of the spine, preceding the spinal cord symptoms by three or four years. In the only case in which he had had an opportunity to make an examination after death, the dura showed no adhesions, and he doubted whether adhesions of the dura to the vertebræ caused the symptoms in his cases. As a result of the increase in the bony tissue the spinal cord was gradually compressed and the patients died. He did not regard the condition the same as that described by von Bechterew.

Dr. Charles S. Potts read a paper entitled "Intradural Cyst of the Spinal Meninges Removed by Operation. Recovery of the Patient. Remarks on the Location of the Spinal Centers for Testicular Sensibility." (*See this Journal*, p. 621.)

DISCUSSION

Dr. Sanger Brown, of Chicago, said it is by the study of such clinical cases as this that physiology may be advanced. Possibly the term "center of sensibility" ought to be used with caution in as much as there are no groups of sensory cytons anywhere in the central nervous system presiding over the sensation of a definite area or portion of the anatomy, which might be regarded as at all analogous to the well-recognized groups of motor cytons.

To illustrate, the physiologist would undertake, if he were able to limit a lesion to a certain group of motor cytons, to paralyze certain groups of muscles, whereas he could not undertake to produce a circumscribed impairment or loss of sensation limited to a definite region by the destruction of any group of sensory cytons, because there are no such groups. In the case here reported the symptoms were produced by pressure upon certain nervous elements, but whether this was exerted upon cell bodies, their processes, or both together, Dr. Brown believed can only be conjectured. The term "sensory center" is not in his opinion admis-

* Dr. Hammond's reply to the discussion on his paper, pages 626 and 627, was unavoidably omitted from its proper place.

sible in the present state of our knowledge as applied to the central nervous system.

Dr. Potts admitted the criticism that the use of the word "centers" was not strictly correct. After sending in his title he had changed it to "spinal centers" which is more accurate. What Dr. Brown had said might be true, still there are in different parts of the nervous system, collections of cells which in common acceptation are known as sensory centers, and which are parts of the sensory neurones. In this case the particular group of cells which give origin to the spinal sensory neurones are situated probably in the first lumbar and lower dorsal segments of the cord.

Dr. Charles K. Mills, of Philadelphia, read a paper upon: "Tumors and Cysts of the Spinal Cord, with a Record of Two Cases." (*See this Journal*, p. 529.)

DISCUSSION

Dr. William G. Spiller, of Philadelphia, said that the case of circumscribed serous spinal meningitis reported by Dr. Martin, Dr. Musser and himself was the first case recognized in life and with operation. The patient is still in perfect health, only she occasionally has a little pain in the back, possibly from the entanglement of some nerve fibers in the scar. Dr. Spiller believes there is no possibility of diagnosing positively between circumscribed serous spinal meningitis and spinal tumor from the symptoms. Variation in symptoms occurs with fluctuation of the fluid in the dural canal.

Dr. George W. Jacoby, of New York, presented two specimens, one taken from a man who had suffered with symptoms of gradually increasing pressure paresis and disturbances of sensation for a period of ten or twelve years. He came to the hospital perfectly able to walk, but with marked weakness of both lower extremities; sensory disturbance was sufficient to enable them to make a diagnosis of probable intraspinal tumor at the sixth dorsal segment. He underwent operation and an enchondroma was found at the sixth dorsal segment growing from the body of the vertebra into the spinal canal, compressing the cord so that the cord was attenuated to a mere filament. From the appearance of the cord it was remarkable that the man was still able to walk and get around as well as he did.

The second case, which is of interest in conjunction with the other, was operated on by Dr. Willy Meyer and a glioma was removed from the cord substance; in this case the entire history covered only three months. The patient began three months prior to operation to complain of weakness of the lower extremities; this weakness progressed and spastic paraplegia developed with all the symptoms of a complete pressure paralysis of the cord. Now the difference in the pathogeny is interesting. The one case going on to complete motor and sensory paralysis in three months, while the other led only to a paresis in ten years, simply points to the difference in the localization of the tumor; one being a tumor growing from the body of the vertebra, the other a tumor growing from the cord substance, and a very small tumor, the size of a large cherry stone. The difference in location produced this difference in symptomatology. When we are unwilling to make a diagnosis of tumor except with a history of long duration it is instructive to remember that in the intraspinal case, the duration was only three months.

Dr. Jacoby alluded to another case in which a tumor was removed

two years ago by Dr. Kiliani, of New York, in which upon opening the dura to their great astonishment they saw a picture such as Dr. Jacoby had never seen reported. The picture was that of disseminated platelets in the pia, little glistening multiple plaques which covered the entire pia. When they first opened the dura and saw the plaques their first idea was that it was a mistaken diagnosis, that it was a meningitis. These little plaques could easily be removed from the pia, and upon chemical examination proved to be made up of pure cholesterol. Dr. Jacoby thought that this was only the second reported case of cholesterol crystals in the spinal cord, the first one having been described by Chiari. Removal of two additional laminae disclosed the tumor, which was then removed, at a higher level.

Dr. Southard, of Boston, said he had published a paper on cholesterol stones in the brain and cord. (*Journal A. M. A.*, Dec. 2, 1905.) In this case, in which there was a general and extensive arterio-sclerosis, there were small masses made up almost purely of cholesterol crystals in several parts of the cortex and central ganglia, as also in the white matter of the spinal cord. The masses were surrounded by thin capsules of gliosis. Dr. Southard had called attention to the relation of cholesterol to miliary gliosis in the spinal cord.

Dr. George L. Walton, of Boston, said, with regard to the level of anesthesia as determining the position of the spinal tumor, one very practical point is to be borne in mind, namely, that the accumulation of fluid, whether in the cord itself or in the membranes, is likely to produce symptoms which may be erroneously credited to the tumor itself. It is true that in the majority of cases the point selected for operation should err in the direction of being set too high rather than too low. But if we always follow this plan we may be misled, as in a case in which recently he had occasion to advise operation. In this case severe pain in the lower back and extending down the thighs was rapidly replaced by paraplegia with numbness extending nearly to the umbilicus. Finding it hard to credit the tumor itself with such rapid growth, he was guided rather by the initial pain, and advised removing the tenth and eleventh dorsal laminae. Operation at this point disclosed the upper limit of the tumor, above which the cord was apparently normal. If the cord had been exposed at the level indicated by the level of anesthesia its normal appearance would have led to the erroneous conclusion that no tumor existed. Dr. Walton was inclined to credit accumulation of fluid with the rapid extension of symptoms.

Dr. John Jenks Thomas, of Boston, agreed with Dr. Spiller in reference to diagnosing circumscribed serous spinal meningitis from tumor. In a case of his the symptoms were indistinguishable from ordinary tumor. There was no fluctuation in their intensity, and the man became markedly spastic and remained so until after the operation. He recovered. This case has recently been reported by Dr. J. C. Munro. In regard to the point of differential diagnosis between growths within the spinal cord from those of the pia or dura, Dr. Thomas confessed that he has less confidence in our ability to differentiate them exactly. Dr. Thomas was rather opposed to operation in the case that Dr. Walton referred to, because of the intense character of the symptoms, coming on suddenly, which seemed to him to point to total destruction of the cord. Within two or three days the man became completely paralyzed, both in sensation and motion. Perhaps the best guide he has himself in differentiat-

ing intramedullary from extramedullary growths is in the order of appearance of the various symptoms. As for example: in a case in Dr. Thomas's service at the Boston City Hospital the man had paralysis of the muscles of one arm for a long time before he had symptoms pointing to involvement of other parts of the cord. There he thought the tumor was within the spinal cord, and so it proved to be at autopsy. There is a suitable guide in the order in which the symptoms appear. The dissociation of sensory sensations he thinks is absolutely unreliable, as it is seen in many other conditions.

Dr. Hugh T. Patrick, of Chicago, said that he would allude to only one or two points. First, he would mention Beevor's sign, as he likes to call it inasmuch as the late Dr. Beevor was the first to describe it; namely, a movement of the umbilicus upward. Assuming that the level of the umbilicus is innervated by the tenth dorsal segment, a lesion at or just above that level may produce motor paralysis with no anesthesia, or only a vague and indefinitely limited sensory blunting. If a patient with such a lesion while recumbent folds the arms across the chest and then raises the head or head and shoulders, the umbilicus moves upward. That is to say, the recti muscles above the umbilicus are normal, those below the umbilicus are paralyzed and the raising of the shoulders causes the normal muscles to contract, pulling the umbilicus upward from one-half an inch to an inch. Of course the first question would be as to whether this movement may not occur in normal individuals. Even in women with lax, pendulous abdomens it is interesting to see with what uniformity the recti muscles contract and the umbilicus remains in the same position.

Dr. Patrick said that with considerable diffidence he would observe that the expression of localized serous meningitis would hardly apply to some of these cases: for instance, the case of Dr. Potts in which there was a marked gelatinous substance with shreds and bits of cells. It may have been a hemorrhagic cyst but to call such a lesion inflammatory seems rather strained. Recently Dr. Patrick had had a spinal tumor operated upon in which part of the tumor was very soft and gelatinous, but other parts were quite sufficiently organized to show that it was a neoplasm.

He emphatically agreed that the ordinary sensory dissociation was of no value whatsoever in distinguishing between an extramedullary and an intramedullary growth. In a quite recent case the dissociation was so marked, and the atrophy of the small hand muscles so like that of syringomyelia, that for a time the diagnosis was in doubt. However, in this case the presence of rather severe pain was of considerable assistance. The tumor was removed by operation. It seems now needless to say that in some cases of spinal cord tumor the symptom of pain is entirely wanting, as such a growth may run its entire course without pain.

Dr. Ernest Jones, of Toronto, remarked that in certain cases the drawing upwards of the umbilicus might be obliquely to one side, a point that gave one the clue to the side of the lesion. When there is paralysis of the upper half of the recti, such as occasionally happens in cases of congenital dystrophy, the reverse occurrence may be seen, namely that the umbilicus is drawn downwards. Dr. Jones said that Dr. Beevor had published an account of the sign in his Croonian lectures on the Action of Muscles.

Dr. Charles S. Potts, of Philadelphia, remarked that he did not want to say that his case was one of circumscribed serous meningitis. He merely called attention to the fact that many of the symptoms in his

case were similar to those found in that condition. It therefore seems to show that the differential diagnosis cannot always be made between tumor and circumscribed serous meningitis, as has been claimed by some.

Dr. M. A. Bliss, of St. Louis, stated that he had had quite a distinct case of circumscribed serous spinal meningitis. A laminectomy was done, and later a second laminectomy, and an endothelioma was then found.

Dr. C. K. Mills, of Philadelphia, said he was not altogether satisfied with the term circumscribed serous meningitis. With regard to the case which he reported he thought it possible that in this case, like in some referred to by Horsley, there may have been diffuse meningitis with what might be termed pockets, corresponding to foci of serous meningitis.

Dr. W. H. Swan, of Colorado Springs, Dr. Charles A. Powers and Dr. Howell T. Pershing, of Denver, Col., read a paper with the title: "A Case of Fracture of the Bodies of the Fourth, Fifth and Sixth Cervical Vertebrae, with Injury of the Spinal Cord." A man, aged 70, fell from a horse, striking on his head. Immediate paralysis and tingling from shoulders down resulted with retention of consciousness and speech. Very severe shock and involuntary evacuations of urine and feces occurred. Improvement was gradual, but loss of control of bladder and rectum and of locomotion was permanent. Chronic eczema in area of sensory loss, disappeared rapidly, eruption remained on sensitive skin. Death occurred after twenty-six months, apparently due to uremia.

Surgical diagnosis in case under consideration was discussed with the question of operative interference. Surgical management and course until fatal termination at the end of twenty-six months was described. Surgical management of injuries to the spine was briefly considered.

Neurological diagnosis: Lesion in seventh cervical segment of cord with approach to Brown-Séquard syndrome. Faradic reactions and trophic condition of muscles, the condition of the reflexes and autopsy findings were described.

DISCUSSION

Dr. Harold N. Moyer, of Chicago, stated that this case followed the general rule that the fifth cervical vertebra is the most frequent seat of cervical fracture. So far as operation was concerned this case favored it. The value of operation in these cases is unquestionable. It is important for the neurologist to determine whether there is external pressure, as hematomyelia is not to be operated upon. Dr. Moyer believed the cervical vertebrae should be fixed after fracture if operation is not performed.

Dr. Pershing, of Denver, said in regard to operation in such cases, the individual patient had to be considered. In the case reported nothing could have been done by operation as regards the fracture of the bodies of the vertebrae. The question of fixation had been discussed carefully, and it was decided in the negative, mainly on account of absence of rigidity and pain, and the patient after being warned had kept his head upon the pillow.

Dr. Alfred Reginald Allen, of Philadelphia, read a paper with the title: "Disturbance of Sensation in a Case of Syringomyelia." (*To be published in this Journal.*) Some observations concerning the sensory tracts of the spinal cord. Photomicrographs illustrating and explaining an interesting case of dissociation of sensibility.

DISCUSSION

Dr. Mills, of Philadelphia, understood Dr. Allen to say that the paths for pain and temperature cross as much as seven segments after entrance. These tracts enter the receptor cells on the same side and then almost immediately cross and then may pass upwards several segments before getting to their place near the periphery. With regard to the tactile pathway, he believed that the more accepted recent view was that the tract passed up on the same side several segments before crossing over, but not as was once taught, to the nucleus at the summit of the column.

The tracts for muscular sense, tactile discrimination, and the non-sensory cerebellar tract passed up on the side of entrance. It was necessary to be quite clear on these matters that no wrong inferences should be made regarding the questions discussed by Dr. Allen.

Dr. Mills suggested that it might be possible that the pathological condition which Dr. Allen described as in the lower part of the cord was the beginning of a subsequent syringomyelia in this locality.

Dr. Morton Prince, of Boston, said he would like to say a word regarding this question of the paths for the transmission of tactile and pain sensations. He desired to recall the case which he reported to this Society some years ago.¹ It was a case of stab wound of the spinal cord. It was as neat an instance of vivisection in the human being as Dr. Prince thought we could desire. It was a neat, clean cut section of the cord extending obliquely across from one side to the other, taking in both posterior columns. It extended forward on the one side, the left, to a point in the periphery of the antero-lateral column opposite to the anterior cornua; but on the right side only as far forward as a point about midway between the anterior and posterior roots. Thus a triangular area could be mapped out in the antero-lateral columns which was severed on the left, but remained intact on the right. Now in this case tactile and pain sensations were totally lost on the right, but were retained on the left. These latter must therefore have crossed to the opposite side and passed upward in the triangular area he had mentioned. Dr. Prince said that, to his mind, there could not be a more crucial experiment. His examination of the cord showed that there must be a path for tactile and probably pain sensations located in a triangle close to the anterior cornua.

On the other hand we have, for example, Meyer's case in which the whole cord was destroyed excepting the posterior columns. These alone were intact and tactile sensation was intact. Therefore it seemed that there must be two paths for touch at least, one by the posterior and one by the antero-lateral column. He believed that that was one of the conclusions we should draw from the evidence at our disposal.

Dr. William G. Spiller, of Philadelphia, stated that Dr. Allen's case was very carefully studied and he was quite sure he had not overlooked Dr. Prince's paper. Dr. Allen's case seems to show that the fibers for pain and temperature entering the lumbar region do not communicate with their neurones in the opposite antero-lateral column for several segments above the level of entrance. Dr. Spiller believes that the pain and temperature fibers ascend in the antero-lateral column, and that tactile fibers ascend both in the posterior and the antero-lateral columns.

Dr. Allen did not understand why Dr. Mills thought tactile sensation decussated in the posterior columns shortly after entering. If the

¹JOUR. NERV. AND MENTAL DISEASE, February, 1905.

fibers for tactile sensation pass up by the posterior columns their nuclei of termination are in the nuclei of Goll and Burdach and that would mean that the path of tactile sensation would have to cross twice, once in the posterior columns and once in the sensory decussation. Dr. Mills says that possibly this process that Dr. Allen showed in the lumbar region may be an early syringomyelic development. Dr. Allen called attention to the fact that it is supposed that the genesis of syringomyelia is a gliosis and this is in no sense a gliosis histologically. Dr. Prince said that there were two pathways for tactile sensation. That is perfectly consonant with Mann's hypothesis. He thought Mann's hypothesis explained why when the posterior column of one side was destroyed you often have preservation of tactile sensation of that side, because the antero-lateral columns are then brought into requisition, but that does not mean that the antero-lateral are the primary paths.

RESOLUTIONS ON THE DEATH OF DR. WHARTON SINKLER AND OF DR. WILLIAM C. KRAUSS, PREPARED BY THE COMMITTEE APPOINTED BY THE
AMERICAN NEUROLOGICAL ASSOCIATION

Resolved, The announcement of Dr. Wharton Sinkler's death was received with a feeling of deep personal regret by all the members of this association, of which he has been the president, as well as a beloved and honored member. Dr. Sinkler's fine qualities of mind and heart, his balanced judgment and his kindly courtesy had endeared him to us all and commanded our respect. Our Transactions for the past twenty years give abundant indication of his scientific activity and his wide interest in neurological questions.

We shall miss his presence at our meetings, but we congratulate ourselves that we have had him so long among us.

The committee recommends that the biographical sketch of Dr. Sinkler, prepared by one of us to be published in the JOURNAL OF NERVOUS AND MENTAL DISEASE, for May, 1910, be entered upon our minutes as a part of its report.

JAMES J. PUTNAM,
CHAS. K. MILLS.

Resolved, The members of this association have learned with sincere regret of the death of Dr. William C. Krauss, for many years one of our honored members and a constant attendant at our meetings. Dr. Krauss was an ardent, effective, conscientious student. His contributions to neurology were of distinct and lasting value.

He will be missed by all the members of our association, who knew him, not only as a learned colleague, but also as one in whom friendship exhibited its finest qualities.

JAMES J. PUTNAM,
CHAS. K. MILLS.

Periscope

Deutsche Zeitschrift für Nervenheilkunde

(Band 38. Heft 1 and 2. 1909)

1. Influence of the Thyroid Gland on the Regeneration of Peripheral Medullated Nerves. F. K. WALTER.
2. Contributions to the Subject of Pseudo-tumors of the Cerebrum. FINKELBURG and ESCHBAUM.
3. Observations on Epileptics—Significance of Sodium Chloride in Certain Forms of Epilepsy. VON DEN VELDEN.
4. Segmentary Character of Paralysis of the Abdominal Muscles. GOLDSTEIN.
5. Specific Syphilitic Processes in Tabes and Syphilo-tabetic Ear Affections. V. FIEANDT.
6. A Case of Hemispasm of the Face with Peculiar Muscle and Electrical Reactions. J. HOFFMANN.
7. An Epidemic of Acute Anterior Poliomyelitis in the Environs of Heidelberg. J. HOFFMANN.

1. *Thyroid Gland and Nerve Regeneration.*—The author's experiments were made on dogs, in which he either cut or compressed the auricular nerve after removal of the thyroid. The results show that the thyroid exerts a marked influence on the regeneration of the nerve. Complete removal causes a marked inhibition of the degenerative and regenerative processes in the nerves even after two months. The presence of a small portion of the gland prevents the inhibitive process. Very small portions however only lessen but do not prevent the inhibitive process. The inhibition cannot be explained by the retarded metabolism and the cachexia strumipriva, because the inhibition does not go parallel with it, and even occurs where the other is not present.

A direct action of the gland is more plausible. Feeding the thyroidectomized dogs with thyroid tablets causes a return of the degenerative and regeneration processes, and with correct dosage replaces the gland itself. A noteworthy feature was the increase in size of the pituitary body in these thyroidectomized dogs.

2. *Pseudo-tumor Cerebri.*—Report of seven cases, one with necropsy. This latter case gave the symptoms of a tumor of the cerebellar-pontile angle. No pathological changes either of a tumor, hydrocephalus, or inflammation were noted. Some of the cases showed cerebral symptoms such as choked disc, and localizing motor and sensory phenomena without any temperature changes. The symptoms would eventually disappear, though in a few cases optic atrophy remained. All of the cases with one exception were under 25 years of age, and in all iodide of potassium was given without result.

3. *Sodium Chloride in Epilepsy.*—The author substantiates in his studies, the experiments of Wyes and others. Early cases of epilepsy were placed upon a diet in which the amount of salt could be estimated. The amount of water ingested as well as excreted, together with the salt

excreted by the urine, was also noted. With the increase of salt in the diet the convulsions occurred. The amount of salt necessary to produce this effect varied. The author adds further that in former experiences an increase in the salt to the diet did not produce a convulsion in every case.

4. *Segmentary Abdominal Paralysis*.—Report of two cases, a clinical case of acute anterior poliomyelitis and a clinical and pathological study of a case of compression myelitis. In the latter case the patient following a fracture of the vertebræ developed a motor and sensory paralysis of the limbs with a paralysis of the lower one third of the oblique muscles. The recti were intact. Pathologically the cord showed compression and destruction in the upper and middle lumbar and the twelfth thoracic segments. Microscopical changes were noted in the eleventh thoracic and the eleventh and twelfth thoracic roots were compressed and atrophied. This case showed the segmental character in the innervation of the abdominal muscles and further showed that the centers for the recti lie higher than those of the oblique.

This is the second case with necropsy on record. (See abstract in this Journal of Salecker's case, Bd. 34, Heft 2.)

5. *Syphilitic Affections with Tabes*.—Fieandt describes a clinical case of incipient tabes associated with an affection of the spinal roots. He comes to this conclusion after a careful clinical study. Associated with this was a bilateral affection of the auditory nerves, which according to him is analogous to the spinal root affection.

6. *Hemispasm of the Face*.—A clinical study of a case of tumor of the cerebellar-pontile angle which began as a clonic spasm around the right eye, later spreading as a tonic spasm of the entire right side of the face. Trauma and cold could be traced as direct influences. Later abducens paralysis, deafness and dimness of vision in the right eye developed.

The galvanic and faradic reactions were decreased in the region of the right facial nerve, but no reactions of degeneration. A peculiar reaction was noted however with the electric current, namely a contraction of a tonic tetanic character (neurotonic reaction), while a similar tetanic contraction was produced if the muscles in this area were tapped (myotonic reaction). Secondary contracture from facial paralysis, and tic were excluded.

7. *Epidemic of Acute Anterior Poliomyelitis*.—Reports 36 cases occurring in the summer and autumn of 1908. The majority of the cases were between the ages of one and four—six cases showed paralysis of the face either alone or in association with other motor paralysis—other unusual features were sympathetic paralysis, sexual, sphincter and vasomotor disturbances.

LEOPOLD (Philadelphia).

Revue de Psychiatrie et de Psychologie Expérimentale

(January, 1910)

1. *Paresis Præcox Occurring Two Years After Infection*. L. MARCHAND and G. PETIT.

1. *Paresis Præcox*.—Paresis usually occurs from ten to fifteen years after infection. In the case reported the paretic symptoms appeared at the age of twenty-two only two years after infection. The diagnosis was confirmed by autopsy.

(February, 1910)

1. The Surgical Method in Mental Medicine. LUCIEN PICQUÉ.
2. The Trophic Influence of the Nervous System on the Muscular Apparatus and on the skin. Prof. BECHTEREW.

1. *Surgery in Mental Medicine*.—The elements of this method are the following: Knowledge of the patient from a psychiatric point of view; study of the relation of the lesion to the mental disorder; use of the statistical method for the purpose of establishing results on a certain basis; the control of the method based upon a knowledge of general pathology, pathological anatomy and the clinic.

2. *Trophic Influence of Nervous System*.—This paper gives a short review of the theories of the influence of the nervous system on the muscles, a discussion of the various muscular degenerations, and the cutaneous trophic disturbances. In general the author believes that it is the sympathetic nervous system, the vasomotors, to which we must look for light on these subjects.

(March, 1910)

1. Delirious Form of a Periodic Psychosis. A. CONDOMINE.
2. Epileptic Auras. A. VALLET and R. MARMIER.

1. *Delirious Periodic Psychosis*.—A form of psychosis much neglected is that described as acute periodic paranoia. Kraepelin in 1893 divided the periodic psychoses into four groups: maniacal, melancholic, circular, and delirious. The fourth group, under which the case reported comes, he now assigns to the manic-depressive psychosis.

The patient is a woman, forty years of age, who since fifteen years old has had several relatively short delirious attacks each year. At foundation they are depressions or excitements accompanied always by delirious ideas (of melancholia and of persecution) and most often by hallucinations of hearing. In the interval the return to normal is complete, there is no dementia, and she recalls fully her delirious experiences.

The author thinks this case justifies the fourth or delirious group of periodic psychoses of Kraepelin's 1893 classification.

2. *Epileptic Auras*.—The authors cite a case of their own and briefly several from the literature of epileptic auras predominately psychic in character.

(April, 1910)

1. Atypical Epileptic Attacks. L. MARCHAND.
2. Algesometry. H. PIÉRON.

1. *Atypical Epileptic Attacks*.—The author does not consider epileptic equivalents nor the symptoms immediately preceding or following the attack but describes certain types of seizures characterized either by their length, or the predominance—the rudimentary character or complete absence of one or more primordial symptoms—or the intervention of divers convulsive phases.

His treatment of the subject shows that the classical symptoms of the epileptic attacks may not only present certain peculiarities, but may by the predominance or the absence of one or the other give to the attack a characteristic physiognomy. In certain cases, the convulsive phases, generally of short duration, may be prolonged; in others, one of the phases may be lacking; the clonic phase may sometimes precede the tonic phase; finally in some cases there are no convulsive phases. The

loss of consciousness and the post-paroxysmal amnesia, considered from most remote times as characteristic of the attack, can also be lacking. These atypical forms are rare; their diagnosis is facilitated, nearly always, by the fact that they are associated with classical seizures.

2. *Algesometry*.—A short discussion of the difficulties of obtaining an accurate measure of the pain sense distinct from other haptic senses and a description of an instrument.

WHITE (Washington).

Neurologisches Centralblatt

(Vol. 28. No. 11)

1. Functional Rectal and Vesical Crises and Their Treatment by Suggestion. W. v. BECHTEREW.
2. The Significance of the Loss of Knee Jerks in Functional Diseases. F. WOHLWILL.
3. The Exposure of the Hypophysis. L. LÖWE.

1. *Functional Crises*.—A class of cases is referred to in which an uncontrollable desire to urinate or defecate, with increased flow of urine or diarrhea, appears whenever the person is nervous or excited. Four such cases are cited, one of which was extreme and had existed for ten years in spite of almost constant and frequently varied treatment. These patients are generally neurotic and of neuropathic heredity, and the condition is often preceded by organic disturbances of the colon or bladder. As to treatment, sedatives are recommended, but psychotherapy is considered most important; the most extreme case described, in whom the condition lasted for ten years, was cured mainly by this method.

2. *Knee Jerks in Functional Diseases*.—The case described was that of a girl of twelve years, rather under-developed and poorly nourished, who suffered from frequent emotional attacks. Examination revealed hypotonia of the muscles and absence of the knee and ankle reflexes, with slight diminution of the pain sense over the entire body. Cerebrospinal fluid was found to be normal. At the next examination the muscle tonus was better and the tendon reflexes present. The case is considered to be functional because of the negative findings with the exception of the reflex anomalies, the results of lumbar puncture, and especially because of the changeable character of the reflexes.

3. *Exposure of Hypophysis*.—A short consideration is given to the methods used to expose the pituitary body, and a new method is recommended as being easier, safer, and giving a larger field for operation than the nasal route. The incision is made above and parallel to the hyoid bone dividing the underlying muscles and opening the pharynx from the front, thus giving free access to the whole cavity of the pharynx. The sphenoid sinus can then be explored and the sella turcica reached as well as other structures in the vicinity inaccessible by other methods.

(Vol. 28. No. 12)

1. "Tænia Pontis." M. OECONOMAKIS.
2. The Innervation of the Sexual Functions. ORLOWSKI.
3. Answer to Dr. Kaes; "Cortex Measurements." K. BRODMANN.
4. Reply to the Above. KAES.

1. *Tænia Pontis*.—By tænia pontis, or filamenta pontis lateralia of the new nomenclature, is understood an isolated bundle of fibers lying in the

groove between the middle and superior cerebellar peduncles, and disappearing above between the cerebral peduncles, below in the cerebellum. Their origin and distribution has never been completely established, some observers regarding them as cerebellofugal, others as cerebellopetal fibers. Horsley has recently by experiments shown them to be cerebellopetal, ending in the dentate nucleus. He thought they took origin from a nucleus near the interpeduncular ganglion as they were unusually well developed in a case of agenesis of the cerebrum. Oeconomakis, on the contrary, in a case of unilateral porencephaly found the tænia pontis of the same side very atrophic, while on the opposite side it was hypertrophied; hence he thinks the tract arises in the cerebral hemisphere.

2. In this article the author assumes various hypothetical "centers" for the sexual functions in the brain and spinal cord which he does not presume to definitely locate, and presents a rather complicated diagram by which he explains the various normal and pathological sexual functions.

3 and 4. *Cerebral Cortex*.—These contributions are a continuation of the controversy between Brodmann and Kaes over the measurements of the cerebral cortex.

(Vol. 28. No. 13)

1. Concerning the Nuclei of the Human Brain-Stem. L. JACOBSON.

2. The Symptomatology of Cysticercus of the Brain (Cysticercus Meningitis and Cysticercus of the Fourth Ventricle). F. CHOTZEN.

1. *Nuclei of the Brain-Stem*.—This contribution is based upon study of serial sections of the human brain-stem in four normal specimens, and is a continuation of work by the same author on classification of the cells of the spinal cord. The position and histological characteristics of the cells are used as the basis for their classification. The cells of the brain-stem are divided into 9 main groups with nearly 50 subdivisions, for details of which the reader is referred to the original article.

2. *Cysticercus*.—A case is reported of a man of 38 years, alcoholic, who suddenly became mentally confused and violent, later developing Korsakoff's syndrome. During the three months until his death appeared symptoms of cerebellar incoördination, increased tendon reflexes, transient Babinski, cranial nerve palsies, periods of unconsciousness, and loss of pupillary light reflexes. At the necropsy extensive basal cysticercus meningitis was found, and the fourth ventricle was filled by the growth which occluded the aqueduct of Sylvius and caused dilatation of the third and lateral ventricles. The author has not been able to find another case reported in which the recurrence and disappearance of the light reflex of the pupil was present in cysticercus.

(Vol. 28. No. 14)

1. Concerning the Centers for Salivary Secretion. YAGITA and HAYAMA.

2. Three Cases of Trigeminal Neuralgia Cured by Galvanization Through the Oral Cavity. V. VITEK.

1. *Salivary Secretion*.—Through animal experimentation by various workers the peripheral innervation of the salivary glands has been established; secretory fibers pass through the root of the glossopharyngeal, small superficial petrosal, otic ganglion and a fine branch of the auriculotemporal to supply the parotid gland; the submaxillary and sublingual glands are supplied through the facial and chorda tympani nerves and the submaxillary and sublingual ganglia. The cells of origin of these secretory

fibers have not been definitely determined, although Kohnstamm has done some important work in this direction. The authors, experimenting on dogs by severing the various secretory fibers proximal to their ganglionic connections, have attempted to trace by chromatolysis the secretory centers. The cells affected resemble the motor type, though smaller, and are distributed in the formatio-reticularis between the facial and Deiters' nuclei. It was not possible to differentiate between the centers of the various glands with accuracy.

2. *Trigeminal Neuralgia*.—Three cases are briefly described in which facial neuralgia was successfully treated by galvanism by applying the positive pole to the second and third divisions of the trigeminus through the mucous membrane of the mouth where the proximity to the nerve trunks and the low resistance favored the application. It was also suggested that the first division might be treated through the conjunctiva of the upper lid.

(Vol. 28. No. 15)

1. Spastic Paralysis with Intact Pyramidal Tracts (Intracortical Hemiplegia and Diplegia). W. SPIELMEYER.
2. The Question of Hysteria. Hysteria and Spondylitis, Hysterical Ischuria, Simulation. M. OECONOMAKIS.

1. *Spastic Paralysis*.—On the basis of two cases which he briefly reports, Spielmeyer concludes that spastic paralysis, hemiplegic or paraplegic, may be caused by chronic degeneration of the cerebral cortex which does not involve the motor projection system. There are evidently neurons beyond those of the pyramidal tract, lesions of which produce symptoms similar to those caused by disturbances of the pyramidal tract itself. According to Spielmeyer these are probably in the upper layers of the cortex.

2. *Hysteria*.—A case of hysteria in a woman of 25 is reported which was repeatedly diagnosed as vertebral caries from the symptoms of retention of urine, paraplegia and anesthesia below the waist. There was also a tuberculous family, and suspicious personal history. Hysteria was diagnosed by the author as the reflexes were normal and atrophy, trophic disturbances and fever were absent. Later almost the entire body was paralyzed and anesthetic. The case was treated by isolation, suggestion and light hypnosis with favorable results.

(Vol. 28. No. 16)

1. Pathology of Bilateral Functions and the Relations of Their Centers to the Cerebrum. A. ADAMKIEWICZ.
2. Some Statistics Concerning Diseases of the Nervous System in the Russian Army During the Russo-Japanese War. L. MINOR.

1. *Diplegia Manuum*.—A case is described of slowly developing anesthesia and muscular atrophy limited to the hands which the author names "Diplegia (motorico-anesthetica) manuum," and by which he attempts to support his theory advanced some twenty years ago concerning bilateral functions.

2. *Nervous Diseases in Russian Army*.—This report is based upon the examination of 26,700 sick and wounded sent to Moscow during the recent war, and consists of a classification of the cases showing affections of the nervous system.

(Vol. 28. No. 17)

1. The Macroscopic Findings in the Brain in my Case of Left-sided Motor Apraxia. K. GOLDSTEIN.

2. The Number of Branches of the Facial Nerve. C. HUDOVERNIG.
3. Pathological Anatomical Changes in the Peripheral and Central Nervous System from Tobacco Smoke Poisoning. S. WLADYCZKO.

1. *Motor Apraxia*.—Necropsy findings are described of a case of motor apraxia which the author had reported clinically a year before. In the meantime repeated examinations had shown no essential change in the apraxia. The lesion, an area of softening, extended on the median surface of the right hemisphere from in front of the corpus callosum to the posterior end of the gyrus fornicatus, destroying the entire extent of the corpus callosum as well as portions of the cortex and white matter of the mesial surface of the first frontal convolution, the paracentral lobule and the gyrus fornicatus.

2. *Facial Nerve*.—Attention is called to the error of speaking of the middle branch of the facial nerve, which no doubt arises from the fact that three electrically excitable motor points are demonstrable. Practically all text-books on anatomy agree in describing but two branches of this nerve into which the main trunk divides just outside of the stylomastoid foramen.

3. *Nicotine Poisoning*.—After reviewing similar work by others, details are given of examination by the author of 27 rabbits and 4 white rats which were subjected to injections of nicotine, extract of tobacco smoke, etc. Three of the rabbits were exposed to the fumes of cigarette smoke. As to the results, the following conclusions are drawn: (1) Prolonged inhalation (daily) of tobacco smoke causes destructive changes in the central and peripheral nervous system. Similar changes, less extensive, follow injections of extracts of the smoke. (2) Besides nicotine, other unknown ingredients are present which produce destructive changes in the nervous system similar to those of nicotine but less severe. (3) Tobacco-pyridine, in the quantity in which it occurs in tobacco smoke, produces no visible changes either in the peripheral or central nervous system.

(Vol. 28. No. 18)

1. The Pathology of Hereditary Diseases. H. HIGIER.
2. Do Preformed Pericellular Lymph-spaces Exist? L. MERZBACHER.

1. *Hereditary Diseases*.—Not suitable for extract.

2. *Lymph Spaces*.—The disputed question as to the existence of lymph spaces about the ganglion cells is taken up by the author who previously doubted their presence. In a case of diffuse carcinoma of the brain he found infiltrations of cancer cells in the larger lymph spaces, about the blood vessels and in some places surrounding the ganglion cells. The unquestioned identity of the tumor cells, their relation to the nerve cells and the fact that they were situated at some distance from blood vessels is considered evidence that preformed lymph spaces do exist, thus agreeing with Fischer, who described similar conditions in cerebral carcinoma.

(Vol. 28. No. 19)

1. The Demonstration of Myelinated Nerve Fibers in the Cerebral Cortex. GREPPIN.
2. On the Article of Adamkiewicz: "Bilateral Functions," etc. H. HIGIER.
3. Remarks on the Preceding Article. ADAMKIEWICZ.

1. *Cerebral Cortex Nerve Fibers*.—A method of examining the nerve fibers of the cerebral cortex is described which is a modification of one

used by Kölliker in 1850. By this method the finest fibers of the cortex are plainly visible and can be studied better than by Weigert's method or its modifications. The disadvantages are that the specimens are not permanent, and the tissue used must not previously have been subjected to the action of formalin or alcohol. The technic is as follows: The brain is hardened in Müller's fluid for six to eight weeks, and sections are cut with the freezing microtome. After washing in distilled water they are put in .05 per cent. solution of safranin for ten minutes. Rinsing again in water they are then placed on a slide and covered with four or five drops of a 2 per cent. to 10 per cent. solution of sodium hydroxid and a cover glass applied. The hydroxid gradually destroys the cellular, neuroglial and connective tissue elements, leaving the nerve fibers plainly visible. These, too, finally disappear.

2. *Bilateral Functions*.—Higier criticises the recent article on "Bilateral Functions," and questions the conclusions of Adamkiewicz.

3. Answer to the above criticism.

INGHAM (Philadelphia).

Monatsschrift für Psychiatrie und Neurologie

(Vol. 27. No. 3. March, 1910)

1. The Cortical and Bulbar Connections of the Hypoglossus—an Experimental-Anatomical Study. MINGAZZINI and POLIMANTI.
2. Studies of the Respiration in Insane Patients. BORNSTEIN and VAN OVEN.
3. The Glycosuria of Alcohol Deliria. ARNDT.
4. Localizations in the Course of the Pyramidal Tracts, Especially in the Crura Cerebri, of the Rabbit. ALICE WEISS.
5. A Contribution to the Comparative Anatomy of the Substantia Nigra, Corpus Luysii and Zona Incerta. TORATA SANO.

1. *The Connections of the Hypoglossus*.—An experimental detail study of the nucleus hypoglossus and its central and peripheral connections. In three apes and two cats the hypoglossal nerve was cut or torn out. In a fourth ape, the most important experiment, the twelfth nerve on the left was extirpated and two months later the cortical center for the tongue in the right hemisphere. The brains were studied in Weigert-Pal series. In those animals in which the peripheral connection of the twelfth nucleus was removed there was comparatively slight degeneration in the peripheral group of cells in the nucleus of that side. In the ape from which also the cortical center was removed there was much greater loss of cells, besides certain degenerations in the internal capsule, peduncle, thalamus and corpus Luysii. By these findings the authors are able to say with some certainty that there are three groups of cells within this nucleus; one which furnishes the root fibers of the twelfth, one which also furnishes root fibers but is in close relationship with the ramifications of the projection fibers from the contralateral cortical center and a third which sends fibers to join the vagus and go to the fauces and larynx. Relative to the trophic effect upon the tongue of destruction of the twelfth nerve, only the anterior part of the left side was atrophied, showing that the posterior part has other innervation, probably chorda tympani, seventh or ninth. The experiments also throw some light on disputed anatomical questions. They show that the perinuclear meshwork of the so-called "fibræ propriæ" have no connection with the nucleus, while the endonuclear mesh is com-

posed of fibers from the cells of the nucleus. The so-called "fibræ afferentes" of the hypoglossus nucleus are likewise shown to have no connection with it. The degeneration in the medial third of the corpus Luysii shows that this body has some relation with the part of cortex removed. In the thalamus the anterior nucleus was unaffected while the medial and the posterior part of the lateral were much degenerated. Monakow has already shown that degeneration of the anterior nucleus and the anterior part of the lateral nucleus takes place after ablation of the prefrontal lobe. The anterior nucleus then is not connected with the cortex at the lower end of the central fissure. Little can be said of the other nuclei from this experiment, since a part of the internal capsule and a small part of the putamen of the lenticular nucleus were destroyed.

2. *Respirations in the Insane*.—The authors have published two previous articles on this subject. They have investigated the total exchange of gases per minute in insane patients and in normal individuals, registering their results in the quotient $\text{CO}_2:\text{O}_2$. They found in the majority of hebephrenias and catatonics a decided lowering of this quotient compared with the normal. Lowy had already shown by animal experiment that the ratio was lowered in castrated animals but that this lowering could be totally compensated by the administration of ovarian extract both in male and female animals. The authors experimented with three of their patients by administering larger doses of ovarian extract and making daily observations of the respiratory exchange of gases. It had apparently no effect and the authors conclude from these results that the falling off in insane patients is more to be compared with that of the senium than that of castration.

3. *Glycosuria in Alcoholic Deliria*.—Of 99 cases of delirium tremens, 30 per cent. showed spontaneous glycosuria; of 26 abortive cases 15 per cent.; of 69 chronic alcoholics, 30 per cent. The author agrees with Raimann that the glycosuria of alcoholic delirium is to be distinguished from that found in chronic alcoholics. The one is toxic in origin and disappears slowly. The other is due to disordered metabolism, does not appear until alcohol has been abstained from for some time and is quite transitory. One of Arndt's cases: a chronic alcoholic, showed glycosuria which disappeared and although he subsequently went through an attack of delirium tremens, it did not reappear. Regarding the pathogenesis of the glycosuria, different authors have proposed the toxic effect of alcohol, the ingestion of large quantities of carbohydrates, yeast-cells, the diuresis that results from beer-drinking, etc. The glycosuria of alcoholic delirium, may be due to the delirium itself, or the late appearing glycosuria may be caused by the increased eating after recovery but before restoration of metabolic balance. These explanations, however, do not fit the cases appearing at the onset of the delirium. Altogether the only important causal factors which can be evolved are individual low metabolic properties and individual intolerance of alcohol.

4. *Localization in the Pyramidal Tracts*.—After an excellent and thorough review of the work done in this line by other investigators the author describes in detail her own experiments. These consisted in first determining the exact location of the various cortical motor centers by electrical stimulation and then excising them with great care under the most aseptic precautions. Several rabbits and a few dogs were used and Marchi series made from each. Her results lead her to draw the following conclusions: Localization in the pyramidal tracts is possible only as far as the crus.

In the internal capsule the hypoglossus bundle lies in the anterior limb or in the meshwork between caudate and lenticular nuclei, while the path of the facial occupies the knee and neighboring part of the posterior limb. The motor portion of the trigeminus appears to be scattered through the anterior limb. In the peduncle there are almost no pyramidal fibers in the lateral third. The hypoglossus fibers are in the most medial part, then the motor trigeminus. The labio-facial occupies the middle third and perhaps some of the mesial and lateral thirds; the auriculo-facial probably exclusively, the middle third. The fibers to the fore-legs are in the ventral part of the mesial and middle thirds. In the upper levels of the pons the trigeminus and hypoglossal fibers are in the dorso-medial half; the fibers to the fore-leg in the ventral half. No further localization was characteristic of all the experiments, so far as this portion is concerned. In following the course of the fibers to the fore-leg the author found fairly numerous fibers going to the posterior columns. The remainder descended in the same and opposite anterior columns. In the region of the nuclei of the cranial nerves were found degenerations on both sides. After extirpation of the trigeminus center the aqueduct nucleus was degenerated while the motor nucleus was free. The large cells of the anterior horn were surrounded by degenerated fibers. The cortico-bulbar path of the motor cranial nerves could not be entirely made out. It seemed, however, most probable that they bent from the pyramidal area into the formatio reticularis and ascended in this region and in the raphe. The decussation appears to take place soon after leaving the pyramidal area. An important finding was that after ablation of the facial and fore-leg cortical centers, a purely one-sided degeneration was found in the neighborhood of the lateral geniculate body, going through this to the upper part of the thalamus. The author was not able to discuss this fully but it naturally suggests a cortico-thalamic path. Besides the findings mentioned there were numerous inconstant and mostly slight areas of degeneration found in various parts—restiform body, trigeminus root, motor paths. These probably were not related to the extirpation, but they need further investigation to clear them up.

5. *The Comparative Anatomy of the Substantia Nigra, etc.*—To be reviewed at the conclusion of the article.

J. H. MOORE (Central Islip).

MISCELLANY

CLINICAL OBSERVATION AND STUDIES OF THE NERVOUS SYSTEM IN CHOLERA.

I. B. Strakowitch. Read at the Third Congress of the Union of Russian Psychiatrists and Neurologists.

The author observed clinically sensory disturbances in the form of anesthæsia and hypalgesia corresponding to certain nerve trunks. There was also a diminution of tendon reflexes. In general there is a picture of a multiple neuritis which is also corroborated anatomically. The phrenic and vagus are often affected. The vasomotor and trophic nerves, however, suffer most. In the typhoidal state a vasomotor paralysis occurs, and is seen clinically as a hyperhæmia and rash of affected parts. This may go to gangrene and death. The typhoidal state is caused not by a euræmia, but by a vasomotor paralysis of the intracranial vessels, seen post mortem as an intense hyperemia of the brain. The algid state the author explains by a paralysis of the splanchnic nerves. Due to this, such an enormous

amount of blood is collected in the abdominal vessels, that the other parts are deprived of their supply, hence the cold surface and elevated rectal temperature. The psychic changes are also interesting. In the first stage there is no fear of death. During the algid period the patient is greatly depressed. During the third stage there is a fear of death and the patient becomes very sensitive, crying and shedding tears at the least provocation. Towards the end a gradual psychic equilibrium is established. There is often a state of euphoria. The so-called cholera psychosis is one of the emotional type. The reasoning faculties are but little, or not at all affected. It is worth noticing that maniacal patients during their invasion with cholera are relieved of their mental symptoms, and their minds are often cleared up. The memory is also partly affected. During convalescence partial amnesia resembling Korsakow's psychosis is often observed.

HYMAN CLIMENKO (New York).

REPORT OF CASE OF FAMILY PERIODIC PARALYSIS. Charles L. Dana. Medical and Surgical Report of Bellevue and Allied Hospitals. New York. Volume 3, pp. 335-338.

Dana here reports in brief a case of periodic paralysis, occurring in a waiter, aged 24, a native of France. In the ascendants, the maternal grandmother, the mother and one sister had similar attacks of periodic paralysis. The patient commenced to have his attacks at the age of twelve years, the intervals between attacks at first being six months, but later only fifteen days. The symptoms are almost stereotyped in the attacks. There is at first numbness in the feet, followed by a slowly progressive paralysis, starting in the feet and extending consecutively into the legs, thighs, abdomen, thorax, hands, forearms, arms and neck. Three hours after the onset the paralysis is complete. Speech and deglutition are occasionally affected for twenty-four hours. The paralyzes usually persist for about three days with gradual recovery. Dana expresses a belief that it is a migrainous equivalent involving the peripheral motor neurons.

JELLIFFE.

Book Reviews

VERGLEICHENDE LOKALISATIONSLEHRE DER GROSSHIRNRINDE, in ihren Prinzipien dargestellt auf Grund des Zellenbaues. Von Dr. K. Brodmann, Assistent am Neurobiologischen Laboratorium der Universität zu Berlin. Johann Ambrosius Barth, Leipzig. M. 12.

The present volume of some 300 octavo pages, with 150 illustrations is the collected result of eight years of work done by the author in the Neurobiological Institute in Berlin. We venture to state in the very beginning that it is the most important piece of work, in its field, that has appeared in the last five years.

In the author's introduction, after outlining his plan of study in the preface, he discusses the different modes of arriving at a knowledge of histological cortical localization. He then takes up cytoarchitectonic, myelotectonic and fibrillotectonic. The two latter he does not propose to study. Cytological architectonic of the cortex, he says, may be viewed from three different view points: the localization of histological elements viewed singly, localization according to cell layers, and finally and more fundamentally, topographical localization on the basis of the whole cortical structure, viewed anatomically. It is to the more detailed study of these anatomical areas that Brodmann applies himself.

These general principles appear in his first section on comparative architectonics of the cortex, in which he first treats of homogenetic and heterogenetic cytological formations, and then in a second chapter he discusses the regional variations in architectonics. These variations involve the number of cells, the size and form of the cells, and the transformations and alterations in the cell layers. The usual six layer types, homotypes, are contrasted with the extreme variants, heterotypes.

A third chapter deals with particular features of cyto architecture in different animals.

Brodmann's homotype, six-layered cortex, is characteristic for man, and his terminology, from outside to center, is as follows:

1. Lamina zonalis. Molecular layer.
2. Lamina granularis externa. External granulated layer.
3. Lamina pyramidalis. Pyramidal layer.
4. Lamina granularis interna. Internal granular layer.
5. Lamina ganglionaris. Ganglion layer.
6. Lamina multiformis. Spindle cell layer.

The molecular layer and the spindle cell layer are the most constant, the external granular and the internal granular layers are the most variable, while the third and fifth occupy a middle ground. Brodmann compares his terminology with that of other workers, and reduces the many layers of some authors very satisfactorily.

A second portion deals with the principles of comparative area divisions of the brain surface. Here the author works out the principle of his topographical analysis, first describing the charts as found in various animals, man, lower apes, lemurs, pteropus, puma, guinea pig, etc. On

this basis he holds, and illustrates his findings with a beautiful series of figures, that there is a general topographical similarity running through the whole series. Certain variants also appear, which call for special comment and explanation. These similarities and differences are discussed in two chapters.

The third portion of the book the author terms his synthetic portion, in which he attempts a morphological, physiological and pathological cortex organology. These are fascinating chapters which are so full of solid material as to render any short abstract impossible.

The whole trend of the author's work is here summarized, and his work pushes the problem of localization, both structurally and functionally, well into the foreground.

It is a work that is so replete with facts, so compact and so closely written, that it defies analysis without repetition. It cannot be compressed. It must be read. It opens up the way for the solution of many problems in all fields of neurology and psychiatry, and is a truly valuable contribution casting much credit on the author, in which the publisher may share somewhat for the excellent book work.

JELLIFFE.

UEBER KRANKHAFTES MORALISCHE ABARTUNG IN KINDESALTER UND ÜBER DEN HEILWERT DER AFFEKTE. Von Prof. Dr. S. Anton in Halle a.S. Carl Marhold, Halle.

In this short but attractive monograph Anton discusses the subject of moral abnormalities in childhood, and the beneficial affect of emotional appeals in their treatment. He takes up, in the initial chapter, the general symptomatology, and calls particular attention to the need for clearer differentiation of what is meant by intellectual defects, and also to the fact that abnormal children are so because of a number of different causes, and should be further grouped according to the psychiatric types. He further assents to the view that "moral insanity" may be an entity, but a rare one. There are, he says, disease processes and abnormal developments, which electively and preponderatively influence the feeling and affect life and the acts that proceed from such influences.

JELLIFFE.

SYMPTOMATOLOGIE UND DIAGNOSE DER ERKRANKUNGEN IN DER HINTEREN SCHÄDELGRUBE. Von Dr. med. Nic. Gierlich. Wiesbaden. Carl Marhold, Halle. 1 Mark.

A short practical article on diagnosis of affections in the posterior fossa. He first discusses the cerebellum, then the pes pedunculi, the occipital lobes, the corpora quadrigemina, pons, medulla, tumors of the fourth ventricle and affections of the base. He further takes up the diagnosis of abscess, meningitis serosa, hydrocephalus, neurasthenia, multiple sclerosis, tuberculosis, and purulent meningitis, hemorrhage and softening, aneurisms of the basal vessels.

In the third chapter, tumors of the cerebello-pontine angle are discussed, and in a fourth circumscribed chronic meningitis. A short surgical summary closes this very practical and careful monograph.

JELLIFFE.

TRAVAIL ET FOLIE. By Dr. A. Marie et R. Martial; Bloud & Cie, Paris.

In this little volume of 102 pages the authors attempt to show some of the relations between work and insanity. A number of statistical tables

are given showing the relative frequency of insanity in the different professions. The authors conclude that despite syphilis, para-syphilis, alcoholism and hereditary degeneracy, the rich man is less subject to insanity than he who has to earn his living. The classifications are too general; a multitude of sins might be covered by "Affaiblissement intellectuel" and "dégénérescence." The statistics, too, are incomplete. But despite all these shortcomings, which the authors fully realize, the book contains many interesting facts and is well worth reading.

A. A. BRILL (New York).

ALIÉNÉS ET ANORMAUX. Par Jacques Roubinovitch. Médecin en chef de l'Hospice de Bicêtre. Membre du Conseil Supérieur de l'Assistance publique, Expert près le Tribunal de la Seine. Felix Alcan, Paris. Fr. 6.

This is a small work of some 300 pages, one of that interesting series published by Alcan, the International Scientific Library, and speaks more particularly to the lay audience, although, for certain reasons, it may justly lay claim to a medical public. It contains a number of shorter and longer essays dealing with a variety of topics—none of which receive exhaustive treatment. Some of these topics are: What is Insanity? How Does One Become So? Alcoholism and Homocide; Absinth Degeneration; Syphilis and Insanity; Fools as They Are; Abnormal Children; and a number of chapters on Backward Children. These latter chapters are of most interest to American physicians, now that more attention is being given by educators to backward and defective children. The new educational laws in France, passed in 1909, are worth reading. Their number and complexity prevent even an abstract in this place, but they indicate the broad spirit that is animating the leaders of educational thought for the care of the children of France. Similar activities could be cultivated by us to advantage, although it may truly be said that our general public school system is in places taking interest in this type of problem. For these chapters alone the work is well worth while.

JELLIFFE.

A MANUAL OF PRACTICAL X-RAY WORK. By David Arthur, M.D., John Muir, B.Sc. N. Y., Rebman Co., 1123 Broadway, 1909.

The authors describe and illustrate in detail, various types of tubes, interrupters, coils, storage cells, and accessory apparatus desirable for use in the field of X-ray therapeutics and radiography. There are chapters devoted to photography with numerous formulæ for developers, etc., localization of foreign bodies, diagnosis and therapeutics, all replete with valuable information and one hundred and twenty illustrations on the subjects discussed. The volume contains much other valuable matter and covers all subjects copiously, though free from repetition and useless illustrations. It will be an important aid and reference for those engaged in X-ray work.

A. A. BRILL (New York).

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